May 10, 1948

STEEL

MAY

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

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EDITORIAL INDEX, PAGE 53

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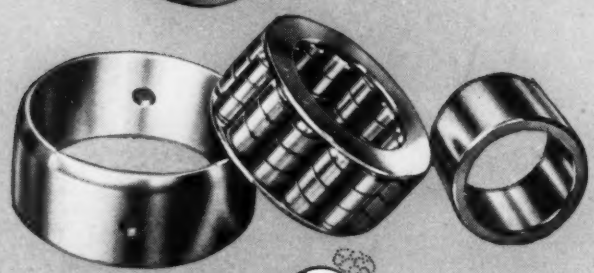

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STEEL

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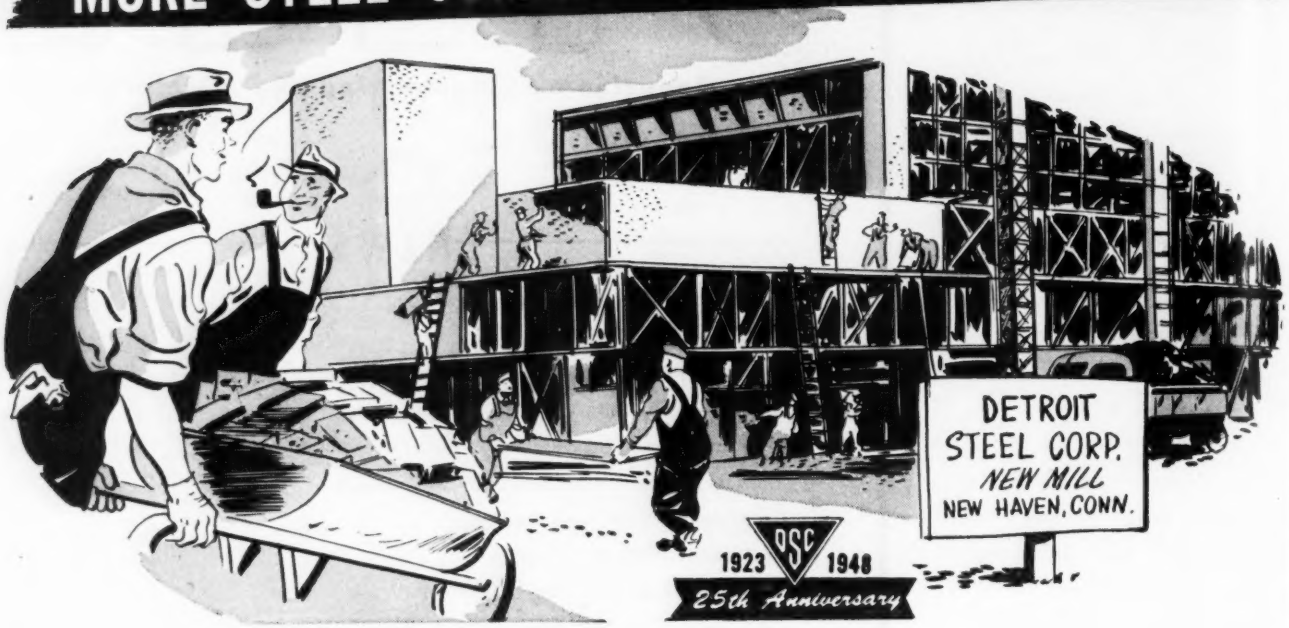
MORE STEEL COMING FOR DSC CUSTOMERS



Here's How We're Going to Have More Steel for You . . .

Dependable Dan Our Customers' Man Invites Correspondence Regarding Your Normal and Regular Requirements

Frankly, we may be unable to accept new business now, but looking ahead, we would like to keep you informed about our expanding facilities.

Now under construction . . . a big, new cold rolled strip mill in New Haven, Conn., scheduled to begin rolling by October 1, 1948 . . . to give Eastern customers 60,000 tons additional producing capacity . . . practically at their stockroom doors.

Improvements at our Detroit Mill to step up that unit's producing capacity to 150,000 tons a year . . . to increase the supply of cold rolled strip available to Midwestern customers by about 35,000 tons a year.

And D.S.C. Reminds You . . . .

That our Detroit mill . . . our Reliance Division network and our Craine-Schrage Steel Division will continue to do everything possible to keep your production rolling . . giving every account equitable consideration . . . constantly planning and working toward greater production and supply . . . and towards higher standards of steel service.

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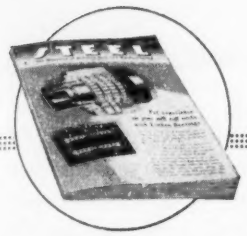


May 10, 1948

Funny Prices

It is apparent that the response of independent steel producers to the action of United States Steel Corp. in reducing prices in its anti-inflationary move will result in an extraordinary and unprecedented price situation.

Some independents which have announced new quotations have cut prices on certain items more drastically than did U. S. Steel. On other items they have announced smaller reductions or no cuts at all. Some major producers are delaying action pending further study of costs and other factors. A few sellers probably will stand pat on old prices. The result is a hodge-podge of prices that involves a wider range of variations and more inconsistencies in relation to value of product than have been present in the industry's price pattern at any time in recent years.

In one respect the present lack of uniformity in steel prices should please members of the Supreme Court and Federal Trade Commission who believe that in banning the basing point system they can prevent alleged price fixing. The very inconsistency of present quotations is convincing proof of absence of price collusion.

Of greater importance is the effect of the new non-uniform prices upon steel consumers and the public interest. Is it good or bad? Unfortunately, the question and the proper answer to it both are largely academic under present conditions. The excess in demand over supply causes buyers to be more concerned over ability to procure tonnage than over the prices they must pay. From the standpoint of public interest, the fact that in general steel prices will be lower than they were overshadows momentarily individual inconsistencies in the price structure.

Obviously the curious present medley of prices cannot stand up under the competitive conditions of a buyers' market. The minute the supply of any finished steel product approaches demand, all existing wide variations in price on that product will vanish like magic.

When that time comes, prices will be forced to conform either to a semblance of the old multiple basing point system or to a modified new system whose characteristics will be influenced in part by the government's present drive toward an ultimate goal of f.o.b. mill prices. The current funny prices will be short-lived.

* * *

PARE HANDLING TIME: At the recent Machine Tool Forum in Buffalo, Myron S. Curtis of Warner & Swasey Co. employed a novel method of illustrating the relative importance of machining time and handling time in machining operations.

"Last time I flew from Cleveland to Detroit," he said, "the actual flight took 28 minutes. Figuratively speaking, the 'machining time' was excellent. But it took me an hour to reach the airport and 20 minutes of waiting before the plane took off. When I got to Detroit, it took me 20 minutes to get my luggage and myself into a bus and 1 hour and 10 minutes to get to my hotel. That made a total of 170 minutes. The 'handling time' was way out of proportion to the 'machining time.'

"Assume that next year I'll make this trip in 14 minutes, airport-to-airport. That represents 100 per cent increase in 'machining time' but only 7.3 per cent increase in overall efficiency. But if 'handling time' can be cut 50 per cent, the increase in overall efficiency will be 44.7 per cent.

"So, next time you are asked to build a machine for 3000 revolutions per minute instead

(OVER)

of 1500, be sure there isn't something else that can be done that will be far more helpful than high spindle speed in stepping up overall production efficiency."

This idea is applicable not only to machining but to almost every operation in metalworking. A survey of 2000 metalworking plants by this publication shows a healthy increase in the use of conveyors, particularly since the end of the war. However, the opportunities for further reductions in handling time through improved materials handling methods are tremendous.

—pp. 95, 104

* * *

FOR BETTER CASTINGS: Thousands who visited the 52nd Annual Foundry Congress and biennial foundry show of the American Foundrymen's Association in Philadelphia last week came away with renewed confidence in the future of the castings industry.

Prior to going to Philadelphia, many of these visitors had been battling daily with critical shortages of metallics, coke and other essentials, as well as inferior quality of some items. They were unduly conscious of expedients. Naturally, the convention and the show reflected the influence of these temporary handicaps, but in a larger sense they emphasized the fact that the major, long run problem of the foundry industry is to produce better castings at lower costs.

Also apparent was a tendency to devote more attention to the problems of foundries of all sizes, rather than to give prominent attention to larger units. This was particularly noticeable in the exhibition, where much of the equipment shown was designed to afford the advantages of mechanism to foundries of moderate or small size.

Many critical observers believe that more new ideas and new items of equipment were unveiled at Philadelphia than in any AFA event since 1930. —p. 64

* * *

"EXTRAS" ON WAGES: Manufacturers who through years of experience have become accustomed to paying "extras" in addition to the base prices of steel and some other materials, henceforth may be forced to get used to paying "extras" in addition to basic wage rates.

Automotive & Aviation Parts Manufacturers Inc. has been conducting a survey on what it calls "fringe extras" or hidden payroll costs. Returns from 198 plants indicate that collateral payments made to or for the direct benefit of hour-paid employees cost more than 12½ cents per hour, over and above direct wages, for every man-hour worked. On the basis of 2000 man-hours per year, the collateral payments amount to $250 per man.

The AAPM figures are conservative because they do not include some fringe payments that might be considered controversial. Also some agreements involving substantial collateral payments were not fully effective throughout 1947. If the present trend continues, "fringe extras" may become a major problem in labor relations.

—p. 75

* * *

TO "HAVE", SANS WAR: Congressman Karl E. Mundt of South Dakota presented an interesting comparison of Communist and non-Communist resources to the annual convention of the Chamber of Commerce of the United States. On the score of population, output of copper, oil reserves and production of coal, pig iron, iron ore, steel ingots and wheat, the 45 non-Communist countries are far ahead of the 12 nations behind Russia's Iron Curtain.

This, of course, is gratifying. However, the two World wars were started by aggressors who felt that they were humiliated by their alleged "have not" status. Today the question seems to be "How can Russia gain a reasonable "have" status, without plunging the world into another war?" —p. 68

* * *

WE FACE AN ORDEAL: In a sense, the new iron ore research laboratory of the Oliver Iron Mining Co. represents the graceful resignation of the United States to an ordeal that has confronted many other industrial nations. Our priceless reserves of high grade ore are being exhausted rapidly and we must be prepared to use concentrates from our abundant taconite, which runs from 25 to 35 per cent iron. The Oliver laboratory is one of several projects devoted to the research that must be successful if we are to continue to rely upon the vast store of iron-bearing minerals in the Lake Superior region. The success of these undertakings is tremendously important to our economy. —p. 108

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

PRICES—Steel price reductions, now being announced in industry's anti-inflation campaign, are assuming an irregular pattern (p. 61). Producers are being guided by their own manufacturing costs to a larger extent than in the past, when price cutting often was a case of following the leader. The reductions are being made in the face of peak demand, when every company can dispose of its entire output easily, and in the face of rising production costs. The move is clearly an effort to bring about national stabilization, and observers are awaiting action by the makers of consumers goods to lower prices to reflect the reductions in such materials and components as steel and electric motors.

LABOR—A large segment of the steel and metalworking industry, represented by those companies organized by the United Steelworkers of America-CIO, has successfully repulsed demands for a third-round wage increase—at least for the present (p. 61). Other segments of the industry, such as the automotive and auto parts manufacturers (p. 75), still are under pressure for new wage concessions and face threatened strikes. Government mediators were working late last week to avert a national railroad strike called for this week. Negotiations for a new coal wage contract will start May 18, with the outcome in doubt.

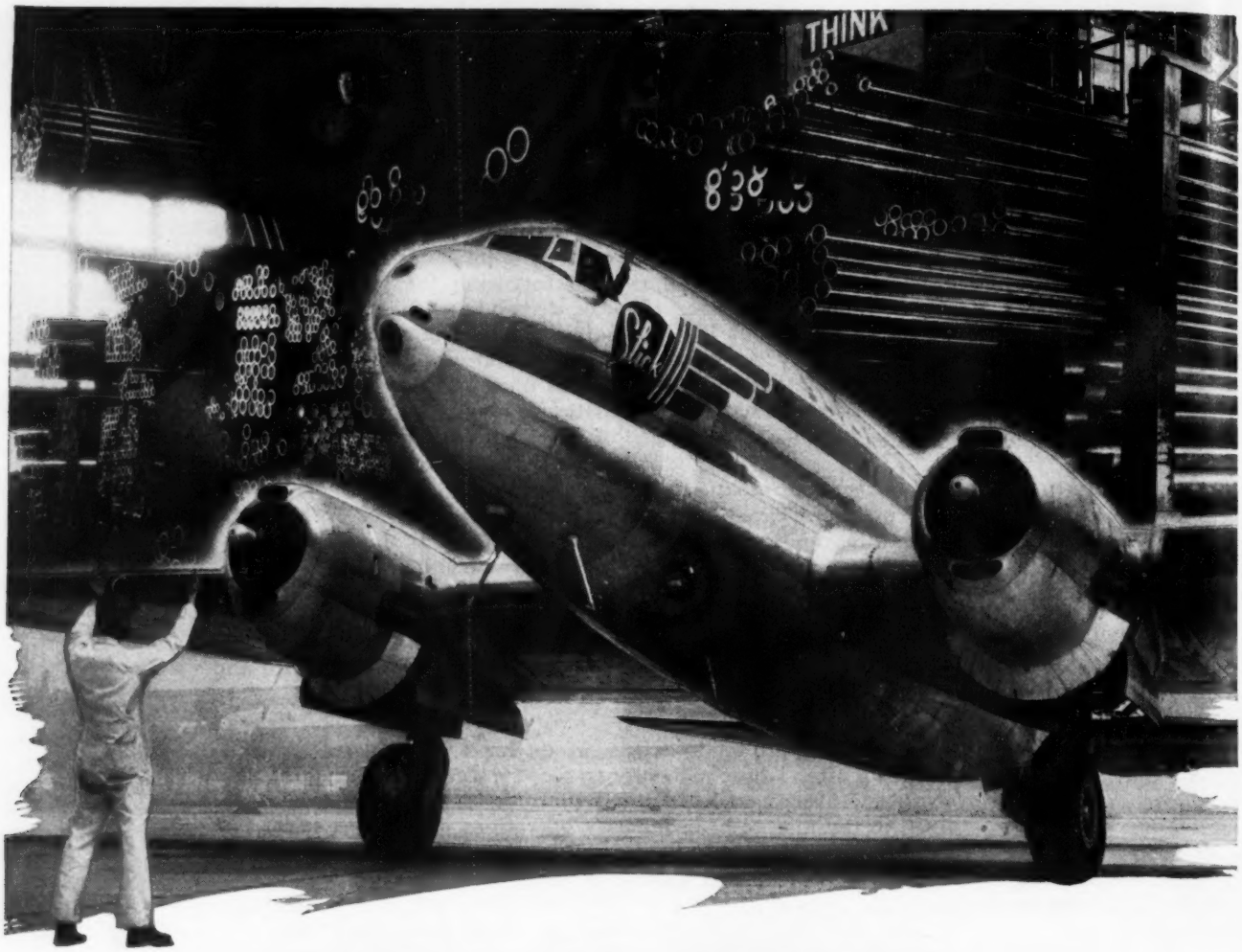
EARNINGS DIP—Rising production costs are reflected in the earnings statements of steel producers, whose net profits for the first three months this year aggregate about 10 per cent less (p. 63) than for the first quarter of 1947. The dip occurred in the face of near capacity operations and record sales. The coal strike, although starting near the end of the first quarter, did not affect earnings for that period, but will have a severely adverse effect on second quarter profits.

BETTER CASTINGS—Nearly 15,000 people affiliated with the foundry industry attended the American Foundrymen's Association congress and show at Philadelphia last week (p. 64) to see new equipment exhibited by more than 260 manufacturers. Emphasis was on castings for peacetime products and on the foundrymen's problem of better castings at lower cost.

BASING POINT—While the Federal Trade Commission's hearings on the steel industry's pricing policies continue much as before the Supreme Court ruling outlawing the basing point pricing system in the cement industry, government officials in charge believe the court's decision foreshadows a similar decision in steel (p. 71). The FTC prosecutor believes the cement case decision "may be construed as a mandate to the steel companies to establish prices at their mills and to sell f.o.b. mill whenever requested to do so by customers." The decision may affect pricing policies in many other industries as well.

TO USE REGULAR TRADE CHANNELS—Procurement of supplies under the Foreign Assistance Act will be handled to the greatest possible extent through private trade channels to help restore normal trade relations throughout the world. This policy (p. 70) has been stated by Paul G. Hoffman, administrator of the aid program, who continues to outline procedure to be followed in obtaining supplies and equipment.

SIGNS OF THE TIMES—New freight rates which became effective last week add substantially to shipping costs of raw materials and finished products (p. 62). Since last October, freight rate increases have raised the cost of producing steel by more than $2 a ton. . . . United States Supreme Court has dismissed the government's patent fraud case against Cold Metal Process Co. and funds impounded by federal court will be turned over to former stockholders of the company (p. 67). . .. Charles F. Kettering, General Motors Corp. research boss, will deliver the Charles M. Schwab Memorial Lecture at the 56th general meeting of the American Iron & Steel Institute (p. 73) in New York May 26 and 27.



Taking the Distance Out of Your Steel Problems

Urgently needed by a Los Angeles engineering company, was a large shipment of stainless steel pipe in a special size. A call to the Ryerson plant in Los Angeles disclosed that the required pipe was not in Los Angeles stock, but *was* on hand in another city.

Ryerson Los Angeles immediately phoned Ryerson in Chicago. Could Chicago supply the desperately needed pipe? Chicago could—and did! The material was quickly trucked to a Chicago airport, flown to Los Angeles, and delivered at the customer's plant the following morning, less than 24 hours after the order was received.

That's how Ryerson—when the steel *is* available—can take the *distance* out of your steel problems. That's how the twelve closely cooperating plants of the Ryerson Steel-Service System often accomplish the seemingly impossible in an incredibly short time. And that's the sort of far-reaching service you can look for when you contact any Ryerson plant for any steel requirement.

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

PRINCIPAL PRODUCTS

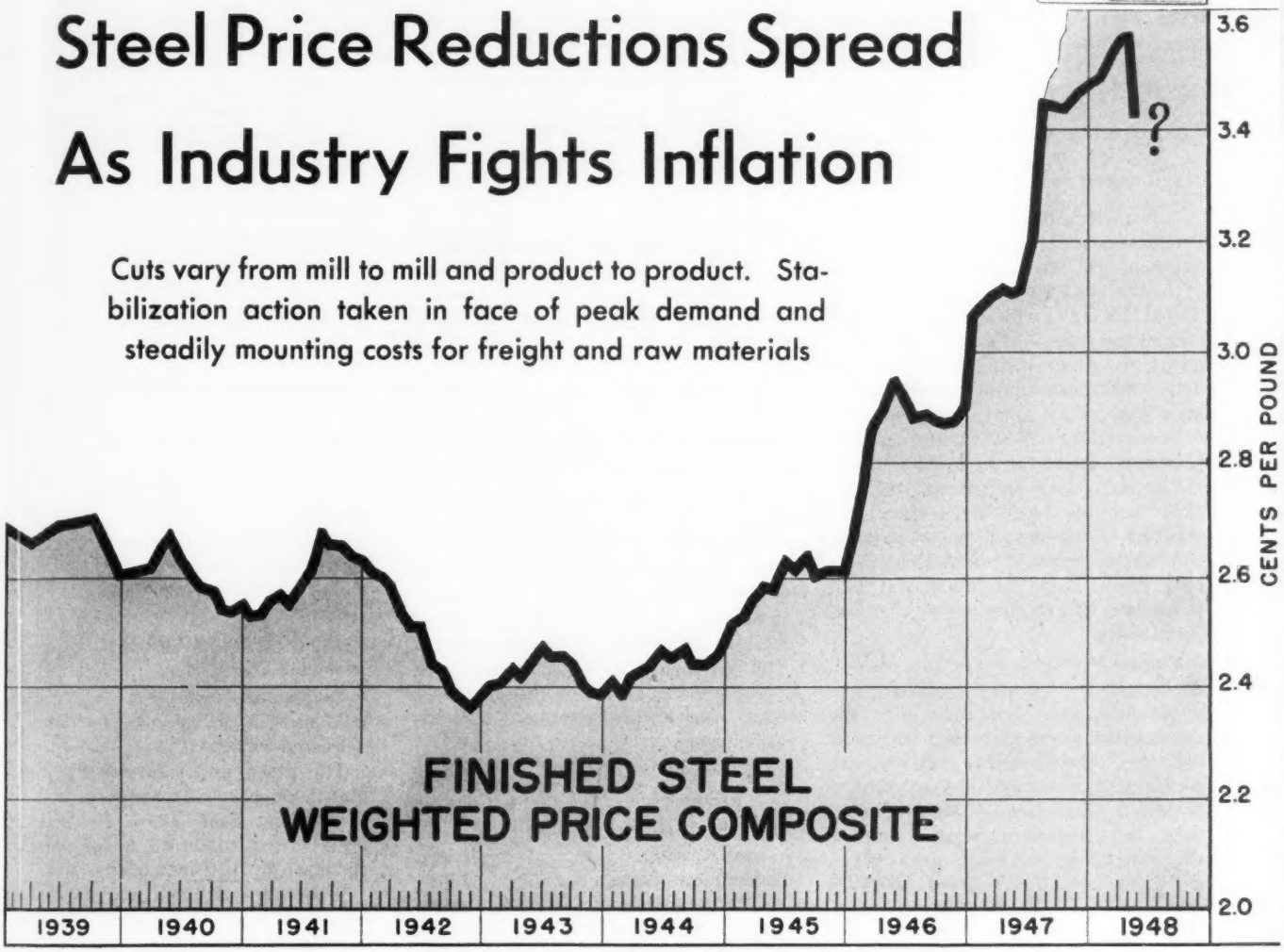
Bars—hot and cold rolled alloy steel reinforcing	Mechanical Tubing	Tool Steel
Structurals	Boiler Tubes and Fittings	Wire, Chain
Plates—Inland 4-Way Floor Plate	Allegheny Stainless—sheets, plates, shapes, bars, tubing, etc.	Bolts, Rivets
	Sheet and Strip Steel	Babbitt
		Metal Working Tools & Machinery, etc.

RYERSON STEEL

STEEL
May
10
1948

Steel Price Reductions Spread As Industry Fights Inflation

Cuts vary from mill to mill and product to product. Stabilization action taken in face of peak demand and steadily mounting costs for freight and raw materials



Reductions of from $1 to $5 on a wide range of steel products is the first general steel price decline since the war. Exact effect on STEEL's weighted steel price composite cannot be determined until the full extent of the price action is learned

PRICE reductions being made by the larger steel producers as a part of industry's anti-inflation campaign will not be uniform, but will vary from producer to producer. Independent steel companies are showing a disinclination to follow in the exact footsteps of United States Steel Corp. subsidiaries in their downward adjustments, but are revising their prices in line with their own manufacturing costs.

In some cases the reductions are larger than those announced by U. S. Steel. In others, the independents have refused to cut on products which were reduced by Big Steel.

Inland Steel Co., Chicago, for example, has reduced the price on enameling sheets by $4 a ton, compared with $2 by U. S. Steel. Floor plate prices were cut $5 a ton, against a $3 reduction by the corporation. On the other hand, Inland is holding its quotations on galvanized sheets, structural shapes, plates and rails, the prices of which were cut by U. S. Steel.

Other variations in the new price reductions are noted. Some producers are quoting cold-rolled sheets $2 a ton lower, others at $1 a ton lower, and still others are holding firm at former prices.

Study Production Costs—Some major companies are continuing to study their manufacturing costs before announcing price revisions. Producers emphasize that the reductions are a move to bring about national stabilization and to halt inflation.

Demand for finished steel products continues as heavy as at any time since the end of the war and no sign of a buyers' market has yet appeared.

Manufacturing costs have shown a steady upward trend. The latest boost to manufacturing costs was the increase in freight rates effective May 6, which with other freight rate increases since last October have increased steel production costs by more than $2 a ton.

Iron ore prices were advanced 65 cents a ton at the beginning of the shipping season, and the recent freight rate rise will cause a further increase in cost to the steel mills. Ahead is the possibility of higher coal prices as the result of concessions already granted or which may be granted to the coal miners.

Competitive Forces Dormant—The present high demand for steel prod-

ucts will prevent steel consumers from shopping around among producers for low quotations. Demand so far exceeds supply that consumers will buy from whatever mill they can obtain steel and not ask too many questions about price. In time, of course, competition is likely to force steel product quotations into some semblance of uniformity.

At the present, some high-cost producers are quoting their products at prices considerably above those of the major producers and are having no difficulty in disposing of their output.

Await Reaction of Consumers—Producers are hopeful that the reductions in steel prices, combined with the refusal of a third round wage increase, will encourage steel consumers, the makers of consumer goods, to reduce their prices and thus help reverse the upward trend in living costs.

General Electric Co. and Westinghouse Electric Corp. already have made reductions in prices. Should their example be followed by a substantial number of metalworking companies, a chain reaction of price reductions may be started which would aid in bringing about national stabilization.

Unions Press for Wage Increases—Although the United Steelworkers apparently have lost their plea for substantial wage increases—at least for the present—other unions are continuing to demand higher rates.

United Automobile Workers-CIO have sanctioned a strike against Chrysler Corp. this week unless wage demands are met. Ford workers have asked a 30-cent hourly increase plus other benefits.

Building trades unions recently have won large wage increases in a number of cities.

Operating railroad brotherhoods late last week were standing firm on their rejection of a 15½-cent wage increase recommended by a Presidential emergency board in an effort to avert a rail strike called for May 11. Nineteen other rail unions have accepted the board's recommendation.

A few metalworking companies with contracts with the United Steelworkers have granted wage increases, generally ranging from 5 to 10 cents an hour.

Government Silent—The Department of Justice and other government agencies, which launched a prompt investigation of the increase in semifinished steel prices in February, have had little to say concerning the recent steel price reductions. The Justice Department said it was not interested in possible "collusion" in effecting price reductions because, as a spokesman told STEEL, "we certainly are not going to act against any industry for reducing prices." Some steel producers had indicated that doubt as to the department's attitude was delaying action in reducing prices.

FREIGHT RATES TO THREE LEADING CONSUMING AREAS

(All rail, carload rates, effective May 6, 1948, on iron and steel articles, cents per 100 lb)

From	To Chicago	From	To Boston	From	To Detroit
Milwaukee	21.0	Jersey City	46.0	Shelby	31.0
Anderson	34.0	Trenton	47.0	Cleveland	34.0
Muncie	36.0	Bethlehem	48.0	Lorain	34.0
St. Louis	38.0	Philadelphia	48.0	Canton	36.0
Detroit	44.0	Syracuse	48.0	Massillon	36.0
Shelby	46.0	Coatesville	52.0	Youngstown	39.0
Cleveland	48.0	Lebanon	53.0	Anderson	39.0
Lorain	48.0	Milton	56.0	Muncie	39.0
Massillon	49.0	Steelton	56.0	Buffalo	46.0
Canton	49.0	Sparrows Point	56.0	Chicago	44.0
Youngstown	53.0	Buffalo	57.0	Milwaukee	44.0
Portsmouth	53.0	Williamsport	57.0	Pittsburgh	46.0
Pittsburgh	57.0	Johnstown	64.0	Weirton	46.0
Weirton	57.0	Pittsburgh	67.0	Portsmouth	47.0
Buffalo	61.0	Youngstown	67.0	Johnstown	52.0
Johnstown	62.0	Cleveland	67.0	Syracuse	52.0
Syracuse	67.0	Lorain	67.0	Williamsport	56.0
Williamsport	67.0	Weirton	67.0	St. Louis-Granite City	57.0
Milton	68.0	Canton	68.0	Milton	57.0
Steelton	69.0	Massillon	68.0	Steelton	63.0
Lebanon	69.0	Detroit	69.0	Lebanon	63.0
Sparrows Point	70.0	Shelby	69.0	Sparrows Point	64.0
Bethlehem	72.0	Muncie	76.0	Bethlehem	64.0
Coatesville	72.0	Anderson	76.0	Coatesville	66.0
Philadelphia	74.0	Portsmouth	77.0	Jersey City	66.0
Trenton	74.0	Milwaukee	78.0	Philadelphia	66.0
Jersey City	76.0	Chicago	79.0	Trenton	66.0

Specific Reductions—Inland Steel Co. was the first large independent mill to announce specific reductions, following the action of United States Steel subsidiaries. Company's reductions follow:

Product	Reduction per net ton
Hot-rolled sheets, 18 gage and heavier	$1.00
Cold-rolled sheets	2.00
Inland Ti-Namel sheets	4.00
Enameling iron sheets	4.00
Electrical sheets	2.00
Hot-rolled strip	1.00
Cold-rolled strip	2.00
Hot-rolled carbon steel bars	1.00
Hi-Bond reinforcing bars	1.00
Hot-rolled alloy steel bars	2.00
Inland 4-way floor plates	5.00
Inland Hi-Steel—all products	2.00
Tie plates	2.00
Joint bars	2.00
Tin mill holloware enameling black plate	2.00

	Reduction per base box
Coke tin plate	$ .10

Jones & Laughlin Steel Corp. announced the following reductions:

Product	Reduction per net ton
Skelp	$1
Floor plates	3
Cold-finished bars	2
Cold-rolled sheet & strip	1
Nails & staples	3
Woven wire fence, 3 columns, amounting to	3
Barbed wire, 2 columns, amounting to	2
Annealed merchant wire	2
Galvanized merchant wire	2
Holloware enameling black plate	2
Buttweld pipe, ½ to 3 in.	2
Otiscoloy & Jaloy	2

Preformed improved, plow, and mild plow wire rope, 8½ per cent on delivered value.

Tin plate and can-making black plate, 10c per base box.

Wheeling Steel Corp. reduced the price of cut nails $3 a ton, and of tin plate by 10 cents a base box.

Wheeling cut black and galvanized butt weld pipe, ½ to 3-inch, $2 a ton.

National Steel Corp. cut tin plate 10 cents a base box.

Northwestern Steel & Wire Co. reduced nails and staples $3 a ton, wire fencing $3 a ton, barbed wire $2 a ton, bale ties $5 a ton, and poultry netting $3 a ton.

Carnegie-Illinois Steel Corp., in addition to earlier reductions, has cut prices on 8-pound roofing ternes to $15.30 a package, special coated manufacturing ternes 10 cents per hundred pounds to $5.80, and 8 and 15-pound manufacturing ternes 10 cents to $7.05 and $8.05 per hundred pounds respectively.

Wisconsin Steel Co. has reduced prices on the following products on Chicago base to meet competitors' reductions. New prices: Hot-rolled carbon bars, 2.85c; hot-rolled sheets, 18-gage and heavier, 2.75c; hot-rolled strip, 2.75c; hot-rolled plates, 2.90c; hot-rolled structurals, 2.75c; hot-rolled alloy bars, 3.20c; cold-finished bars, 3.45c; cold-finished alloy bars, 4.00c.

Increased Costs Cut Steel Earnings

RISING COSTS counteracted increases in selling prices and production and pushed the steel industry's net earnings for 1948's first quarter approximately 10 per cent below those of the corresponding period of 1947.

Furthermore, the second quarter does not offer much hope of improvement despite the unabated demand for steel. For the most part, effects of the coal mining stoppage beginning in the latter part of the first quarter of 1948 were not reflected in that period's earnings but will make themselves felt in the second quarter.

This, plus price reductions and increased railroad freight rates, suggest that second-quarter net earnings will be lower than those of the first quarter.

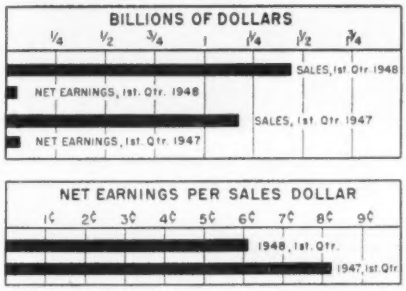
Also, continued high costs of plant and equipment replacement will likely prompt various producers to continue to set aside from earnings substantial additional sums for additions and betterments.

Aggregate Earnings Off—The accompanying compilation by STEEL reveals that 15 companies representing 76 per cent of the nation's ingot capacity had aggregate net earnings of only $87,185,609 in the first quarter of 1948 compared with $96,687,533 in the like period of 1947, yet their total sales in the first quarter of 1948 were $1,421,137,123, against only $1,183,279,388 in 1947's first quarter. Thus, in the first quarter of 1948 their net earnings per dollar of sales averaged only 6.13c, compared with 8.17c in first quarter of 1947.

This points up the fact that increased costs of products and services bought were responsible for the drop in earnings, for the steel industry's production of steel for ingots and castings in the first quarter of 1948 was 22,025,610 net tons, compared with 20,942,794 in the like quarter of 1947, and steel prices in the first quarter of 1948 reflected appreciable increases over those of the first quarter, 1947.

Sales and Net Earnings

(15 steel producers with 76 per cent of nation's ingot capacity)



Sales Increases Shown — Of 16 companies for which 1948's first quarter sales reports were available, all but one showed increases over the first quarter of 1947.

Twenty-one companies in STEEL's compilation reported net earnings in the first quarter of 1948 of $104,900,492, contrasted with $113,171,605 in the corresponding quarter of last year. However, in the fourth quarter of 1947 their net earnings were only $95,163,676.

Quarterly Quotas on Six More Steel Products Set

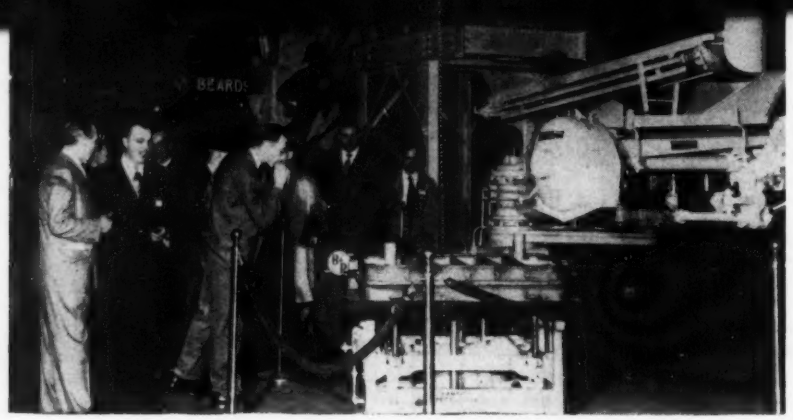
Second quarter export quotas of 207,500 net tons have been established for an additional group of six iron and steel products, Department of Commerce has announced through its Office of International Trade. These quotas supplement the longer list of quantitative export limitations on specified steel products announced earlier (STEEL, Apr. 19, p. 55).

Commodity	Quota (net tons)
Unlined storage tanks	22,000
Rails, 60 lbs and over, per yard	70,000
Seamless casting and oil line pipe	55,000
Welded casting and oil line pipe	35,000
Seamless black pipe	5,500
Welded black pipe	20,000

	Net Earnings 1st Qtr. 1948	Net Earnings 1st Qtr. 1947	Net Earnings 4th Qtr. 1947	Sales 1st Qtr. 1948	Sales 1st Qtr. 1947
United States Steel Corp.	$33,957,341	$39,234,511	$29,791,687	$556,002,239	$475,019,255
Bethlehem Steel Corp.	15,499,331	16,090,426	12,377,647	295,576,646	237,525,443
Republic Steel Corp.	9,132,980	11,516,795	7,906,779	182,324,128	156,201,874
Jones & Laughlin Steel Corp.	5,150,704	6,337,132	5,700,853	97,531,525	78,263,438
Youngstown Sheet & Tube Co.	6,423,566	7,335,749	5,853,087	88,033,031	72,035,331
National Steel Corp.	8,661,760	7,325,058	6,935,133		69,900,423
Inland Steel Co.	8,458,544	7,995,857	8,096,975	90,739,868	70,272,728
Armco Steel Corp.	5,867,347	5,918,876	6,836,813		
Wheeling Steel Corp.	2,781,257	2,948,268	2,014,900	33,476,159	28,645,563
Colorado Fuel & Iron Corp.	1,449,231	1,712,323	1,533,110		25,805,553
Pittsburgh Steel Co.	900,310	716,472	1,185,275	22,219,467	18,348,789
Granite City Steel Co.	812,097	398,295	790,518	7,691,171	6,935,175
Continental Steel Corp.	213,417	393,223	298,384	7,170,087	6,603,159
Crucible Steel Co. of America	567,786	891,810	773,224		
Keystone Steel & Wire Co.	1,368,224	1,342,815	1,110,058	8,745,914	7,488,905
Follansbee Steel Corp.	611,305	500,849	900,816	7,342,764	5,723,571
Copperweld Steel Co.	492,697	255,311	1,057,208		11,109,237
Portsmouth Steel Corp.	1,028,545	1,009,321	1,003,838	13,692,129	10,303,369
Barium Steel Corp.	676,062	380,694	498,810	12,137,000	8,587,000
Carpenter Steel Co.	429,694	661,871	341,789	6,139,863	6,622,523
Rotary Electric Steel Co.	418,294	205,949	156,772	4,452,132	3,290,265
Midvale Co.	6,537		184,336*	5,454,073	
Totals	$104,907,029	$113,171,605	$94,979,340	$1,438,728,196	$1,298,681,601
FINISHING CAPACITY ONLY					
Acme Steel Co.	$1,964,468	$2,055,118	$1,999,843	$14,914,592	$12,884,322
Superior Steel Corp.	225,717	275,743	175,004	4,034,180	3,753,458
PIG IRON CAPACITY ONLY					
Interlake Iron Corp.	$1,146,506	$965,031	$1,107,667		
Sloss-Sheffield Steel & Iron Co.	529,819	439,101	687,972		

* Net loss.

Foundrymen St

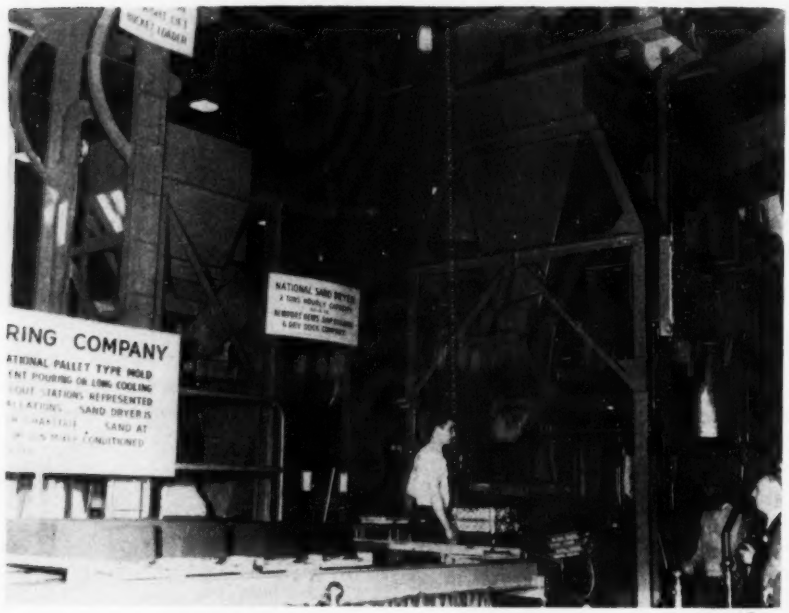


This Beardsley & Piper sandslinger, above, was among the new and improved sand handling devices at the foundry show

THE 52nd Annual Foundry Congress and biennial foundry show of the American Foundrymen's Association, held in Philadelphia last week, had restored to it the aspects of prewar events. Sufficient time has elapsed since end of World War II for technological developments in the manufacture and use of castings and designs of equipment utilized in production of castings to reflect peacetime motives.

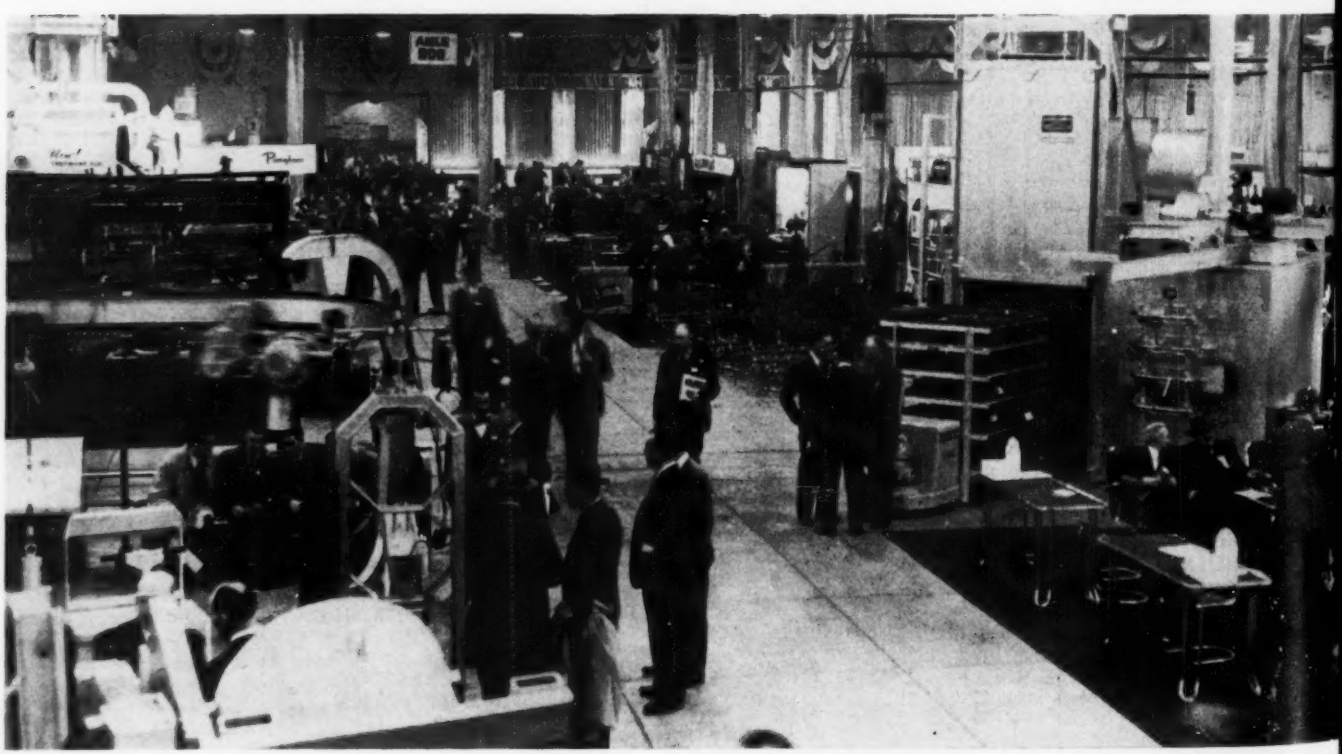
During the week in the neighborhood of 15,000 persons representing all phases of the foundry industry participated in congress sessions or visited the exhibit. Also reminiscent of prewar, was the large registration from outside the United States, delegations from 12 overseas countries as well as Canada and Mexico being on hand.

Many Technical Sessions—Comprising the congress program were 19 technical sessions, five lecture course sessions, eight shop course sessions, the annual business meeting, six roundtable luncheons, four dinners and the annual banquet, in addition to numerous committee meetings and gatherings of several foundry trade associations. The nearly 60 papers



Sand dryer, mixer, molding station, mold conveyor and shake-out station, above, were operated by National Engineering Co.

This view, below, down one of the main aisles at the foundry show May 3-7 shows booths of some of the 270 exhibitors



Study Production, Cost Problems

AFA congress and exposition at Philadelphia attracts 15,000. Equipment exhibited by more than 260 manufacturers. Emphasis is on castings for peacetime

presented at technical sessions and other formal and informal discussions throughout the week covered the full breadth of foundry activity.

The foremost problem of the foundry industry is that of producing better castings at lower costs. Currently, the problem is complicated not only by critical shortages of metallics, coke and other materials, but by inferior quality of some of the materials. Depletion of supply of former high grade raw materials presents a challenge to technologists, but the possibilities in improving both methods of production and the quality of castings provide great potentials for progress in the foundry industry.

Great Quantities Needed — Great quantities of castings will be needed in coming years, whatever may be the trend of future world events. If the United States and other nations can find the key to world peace, the needs for castings probably will exceed anything yet experienced. If peace is not won, the industry foresees re-enactment of the difficulties of 1941-1945. These important problems constituted the keynote of the Philadelphia foundry congress and show.

President Max Kuniansky, vice president and general manager, Lynchburg Foundry Co., Lynchburg, Va., presided at the AFA annual meeting. New officers for 1948-49, previously nominated, were elected as follows: President, William B. Wallis, president, Pittsburgh Lectromelt Furnace Corp., Pittsburgh; vice president, Edwin W. Horlebein, president, Gibson & Kirk Co., Baltimore; and directors, Thomas H. Benners Jr., managing partner, T. H. Benners & Co., Birmingham; Norman J. Dunbeck, vice president, Eastern Clay Products Co., Jackson, O.; Alfred M. Fulton, vice president, Northern Malleable Iron Co., St. Paul; Robert R. Gregg, foundry manager, Reliance Regulator Corp., Alhambra, Calif.; and Victor E. Zang, vice president, Unitcast Corp., Toledo, O.

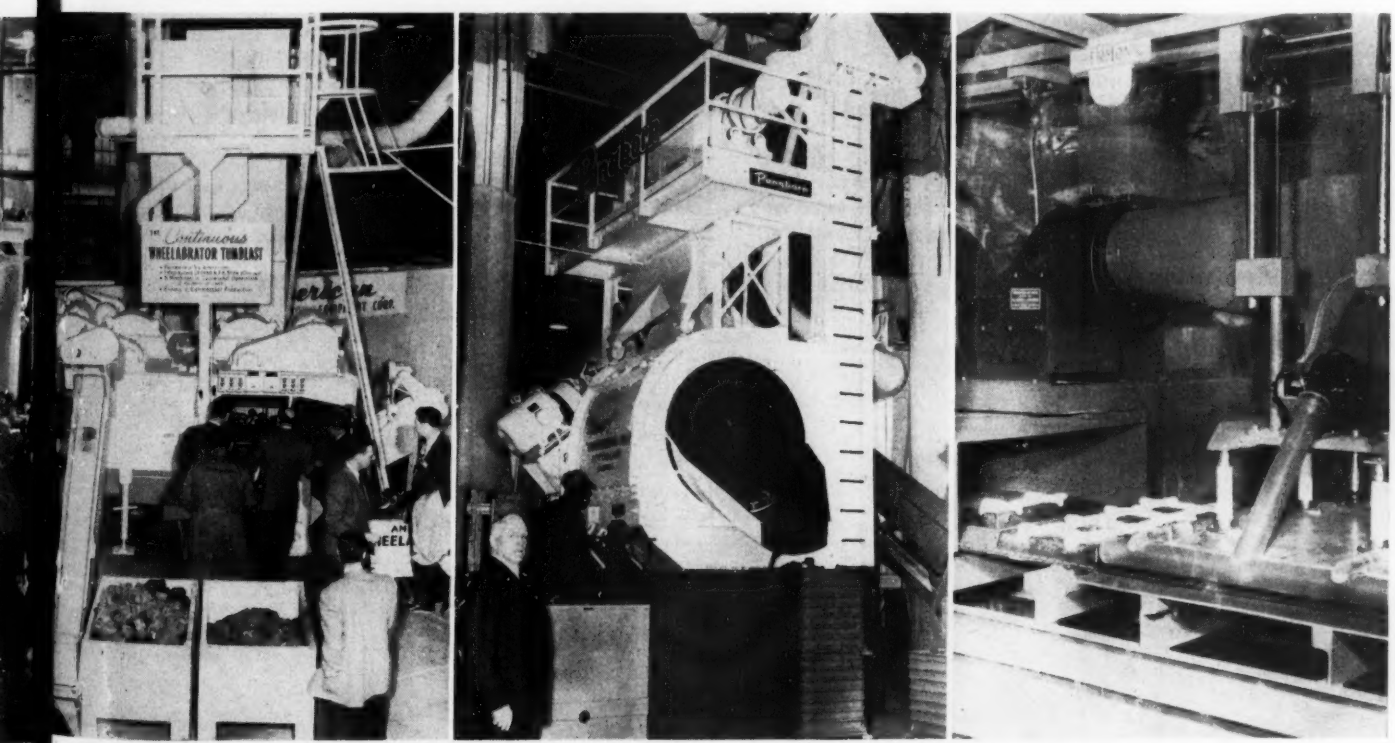
Following the annual meeting, Charles E. Nelson, technical director, magnesium division, Dow Chemical Co., Midland, Mich., delivered the Charles Edgar Hoyt Annual Lecture on "Control of Grain Size in Magnesium Castings."

Compton Is Banquet Speaker — Principal speaker at the annual banquet was Dr. Karl T. Compton, president, Massachusetts Institute of Technology, Cambridge, Mass., his subject being "Team Play of Hand and Brain."

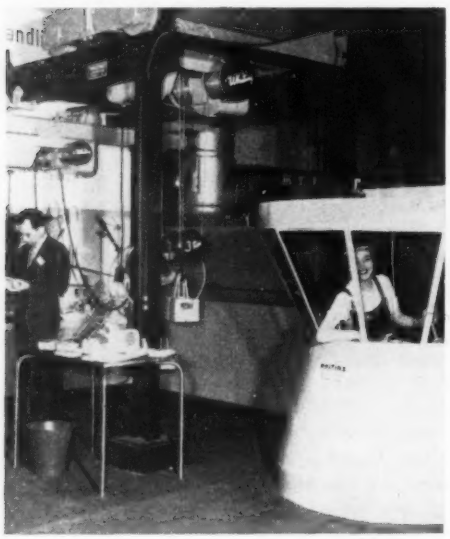
Three outstanding foundrymen were presented with gold medals in recognition of their personal contributions to the advancement of the castings industry. The recipients and the medals were as follows:

Egbert H. Ballard, who retired in 1943 as general superintendent of

Castings and steel parts now may be cleaned at higher speeds and lower costs with continuous abrasive blast equipment on the market. At the left, below, is shown American Wheelabrator's Tumblast and in the center Pangborn's Continuous-Flo Rotoblast, both of which were in operation at the foundry show. The electronic core baking oven shown at the right was built by the Induction Heating Corp.



Welds previously inaccessible for automatic submerged melt welding now can be made with manual unit shown by Linde Air Products Co.



Full-vision crane cab equipped with new magnetic controls was shown by Whiting Corp. Recently introduced hoists appear in background

foundries and pattern shops, General Electric Co., Schenectady, N. Y., the William H. McFadden Gold Medal in recognition of his "steadfast and sincere efforts in behalf of the association while serving as its president during most difficult times, and his continual contributions to the foundry industry throughout his business career."

Richard G. McElwee, Iron Foundry Division manager, Vanadium Corp. of America, Detroit, the John A. Penton Gold Medal for "outstanding contributions to the dissemination of information to the foundry industry, especially for his splendid efforts on behalf of the Cupola Research Project."

Peter E. Rentschler, president, Hamilton Foundry & Machine Co., Hamilton, O., the Peter L. Simpson Gold Medal for his "oustanding work in promoting better housekeeping and safety practices in the foundry and for the inspiration he has given the foundry in public relations."

Retiring President Kuniansky was awarded an honorary life membership in the association.

Many Exhibits—The foundry show was one of the largest and most interesting in recent years, with more than 260 suppliers of foundry equipment, materials and services participating with exhibits in Convention and Exhibition Halls. Added interest was created by the fact that more new equipment was displayed than at any other AFA show since 1930. Many new and improved products were not completed immediately after the end of the war in time for display at the 1946 exhibit in Cleveland, and this helped to account for the larger number of new developments which had their initial showing in Philadelphia. It is probable that the 1948 show set a record in the number of new items introduced during a two-year period.

Prominent among new developments unveiled at the Philadelphia show were:

American Wheelabrator & Equipment Corp., Mishawaka, Ind.—a sand cutter that cuts and piles 400 tons of sand in 8 hours.

Independent Pneumatic Tool Co., Aurora, Ill.—a 360-cycle electric portable grinder.

Beardsley & Piper Division, Pettibone Mulliken Corp., Chicago—a portable sand handling unit for small foundries which provides magnetic separation, screening and aeration of 20 tons of molding sand per hour.

Moulders' Friend, Dallas City, Ill.—a portable sand conditioner.

Whiting Corp., Harvey, Ill.—a dust removal unit.

Link-Belt Co., Chicago—an oscillating conveyor and hydraulic vibrating feed conveyor.

Frank G. Haugh Co., Libertyville, Ill. — hydraulically-operated tractor-mounted dump buggy.

Metallizing Corp. of America, Chicago — constant-speed electrically-driven metal spraying gun capable of spraying 22 pounds of steel per hour.

Champion Foundry & Machine Co., Chicago—a junior size core blower for small foundries.

Milwaukee Foundry Equipment Co., Milwaukee—a jolt squeeze stripper molding machine and several core blowers.

National Engineering Co., Chicago—sand mixer with rotary cooling hood.

Fisher Furnace Division, Lindberg Engineering Co., Chicago—a two-chamber induction melting furnace and a furnace blower.

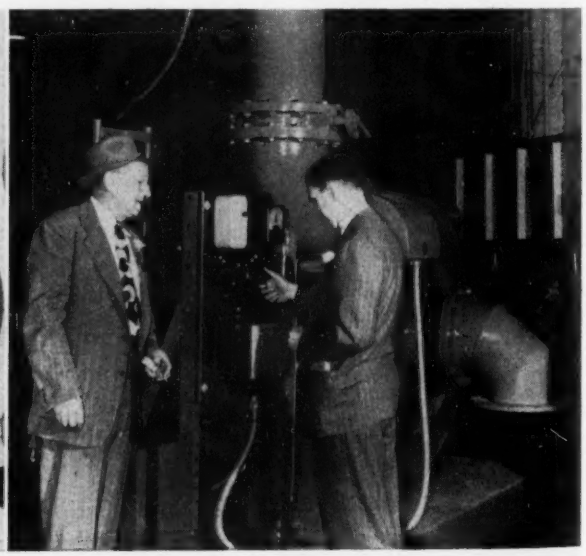
S. Obermayer Co., Chicago—cradle tong for crucibles.

Despatch Oven Co., Minneapolis—

(*Please turn to page* 158)

More than a dozen manufacturers of abrasives had booths at the foundry show. Among the displays, at left, below, was that of Peninsular Grinding Wheel Co.

This 20 hp Ingersoll-Rand blower for cupolas and other industrial uses at right, below, delivers air at 3000 cfm and 1 lb pressure and has constant air-weight control



Allocations Committees To Be Named

STEEL company sales executives meeting last week with Office of Industry Co-Operation officials agreed to the establishment of two committees to assist in the voluntary allocation of steel. One will be a steel products advisory committee and the other a steel products task committee. The latter will consist of assistants to steel sales executives and its principal job will be to distribute allocated steel tonnages among the various producers on the basis of capacity.

Charles Sawyer, new secretary of commerce, greeted the steel men as one of his first official acts.

The steel men were told that the allocations program will be speeded up. The housing program requirements are expected to be ready for definite allocations within three or four weeks, and other programs will be ready soon after that.

The petroleum program will be pared down from the figure of 15 million tons of steel over the next 18 months that has been requested, but the program will remain very large.

The shipbuilding program recently recommended by Secretary Forrestal will require 650,000 tons, if approved by Congress.

OIC has been instrumental in placing some steel informally for several government agencies, including the Navy and the Atomic Energy Commission.

The aluminum and copper industries soon will be called in to consider voluntary allocations for the expanded aircraft building program.

Cold Metal Patent Suit Dismissed by High Court

United States Supreme Court last week refused to review dismissal of a government suit seeking cancellation of two patents obtained in 1930 by Cold Metal Process Co. and Abram P. Steckel, inventor, both of Youngstown.

As a result of the court's denial of a writ of certiori, former stockholders of Cold Metal Process Co. will receive approximately $9,600,000 in payments for infringement of patents which were impounded in federal district court at Cleveland in 1944. The money was paid by seven steel companies which settled patent infringement suits at that time. Payments by companies include: Armco Steel Corp. (American Rolling Mill Co.), $2,407,500; Bethlehem Steel Co., $2,132,100; Jones & Laughlin Steel Corp., $1,380,600; Wheeling Steel Corp., $1,643,400; Youngstown Sheet & Tube Co., $1,235,700; Inland Steel Co., $600,000; and Crown Cork & Steel Co., $200,000.

The government filed the original suit against Cold Metal Process Co. and Steckel in July, 1943, charging that the patents on the cold rolling of steel had been obtained through fraud and a mistake in the patent office. The federal district court and the circuit court of appeals both ruled there had been no fraud and that the patents were valid. Since then the patents have expired.

Pressed Metal Group Tours Bethlehem Plant

Grave concern over the Supreme Court decision in the cement basing point case was voiced recently by Tom J. Smith Jr., president, Pressed Metal Institute, at the Philadelphia district meeting of the institute in Baltimore. This decision raised serious questions for various industries, including steel and steel consuming lines.

He spoke at a dinner at the Sheraton-Belvedere Hotel following an inspection trip by the Philadelphia district members of the institute to the Sparrows Point steel plant as guests of Bethlehem Steel Co. Approximately 125 made the trip.

Walter A. Gorrell, chairman of the Philadelphia district, and president of E. J. McAleer & Co., that city, presided at the dinner, and announced the June meeting would be held at Coatesville, Pa., where members would be the guests of the Coatesville Plate Washer Co., of which R. L. Batteiger is president.

Mr. Smith expected the stamping industry, as well as other industries, would soon face more rigid controls, especially if the threat of war becomes more menacing.

Present, Past and Pending

■ GREENFIELD TAP & DIE BUYS MICHIGAN FIRM
GREENFIELD, MASS.—Greenfield Tap & Die Corp., this city, has purchased for cash the Ampco Twist Drill Corp., Jackson, Mich.

■ CHRYSLER CORP.'S ASSEMBLIES INTERRUPTED
DETROIT—Interruption to shipments of steel body stampings from a principal supplier forced Chrysler Corp. to curtail assemblies of Dodge, De Soto and Chrysler passenger cars last Thursday night, resumption being scheduled along with the Plymouth Division down for lack of bodies, for Tuesday morning.

■ CONSTRUCTION OF HOT STRIP MILL BEGINS
PROVO, UTAH—Construction is underway on the new hot strip mill near here for Geneva Steel Co., a U. S. Steel Corp. subsidiary.

■ FABRICATING COMPANY OPENS NEW PLANT
STEUBENVILLE, O.—Ohio Valley Steel Sales Co. last week opened its new plant at nearby Irondale, O., where steel fabricating, warehousing and prefabricated building manufacturing will take place.

■ NEW ELECTRIC FRIT SMELTER ANNOUNCED
CLEVELAND—Perfection of an all-electric wholly-continuous frit smelter has been announced by Ferro Enamel Corp. It represents a departure from the conventional batch or continuous fuel-fired units now used.

■ BLAST FURNACE REBUILT IN 32 DAYS
MIDDLETOWN, O.—Armco Steel Corp.'s 900-ton No. 2 blast furnace has been rebuilt in the remarkable time of 32 days 10½ hours from blow-out to blow-in.

■ U.S. EXPORTS AND IMPORTS INCREASE
WASHINGTON—U. S. exports in March were valued at $1,141,000,000, exceeding February levels but remaining 11 per cent below 1947's monthly rate. March imports were up to a new record of $666,200,000.

■ PLACES BIG ORDER FOR VENDING MACHINES
NEW YORK—Telecoin Corp. has awarded a $2 million contract to the Clyde Porcelain Steel Co., Clyde, O., for manufacture of juice vending machines.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Communist bloc controls only small part of world productive capacity and economic wealth, congressman tells Chamber of Commerce

AS USUAL, many thought-compelling speeches featured this year's annual convention of the Chamber of Commerce of the United States. Three of them were especially worthy of attention for their sound wisdom.

One made it clear that in the current "cold" war between the United States and Russia, the countries lined up behind the Iron Curtain control but a small percentage of the world's productive capacity and economic wealth.

The second made it equally clear that the recent tax reduction was premature and unjustified, and that higher taxes are to be expected—and in the near future.

The third cited the postwar advances in employment and output.

In the first of these speeches, by veteran congressman Karl E. Mundt (Rep., S. Dak.), members of the House Foreign Affairs Committee, the following reassuring comparison of strength was depicted:

	Communist Bloc 12	Non-Communist Countries 45
Number of countries		
Population	303,000,000 or 12.5 per cent	1,968,000,000 or 87.5 per cent
Crude oil production	621,010 barrels daily or 7.4 per cent	7,757,030 barrels daily or 92.6 per cent
Smelter output of copper	186,000 metric tons or 8.5 per cent	1,988,000 metric tons or 91.5 per cent
Proved oil reserves	6,550,000,000 barrels or 9.32 per cent	64,762,000,000 barrels or 90.68 per cent
Coal and lignite production	221,000,000 metric tons or 15.2 per cent	1,239,000,000 metric tons or 84.8 per cent
Pig iron production	17,874,000 metric tons or 17.5 per cent	84,155,000 metric tons or 82.5 per cent
Iron ore production	29,228,000 metric tons or 18 per cent	132,772,000 metric tons or 82 per cent
Steel ingot production	26,275,000 metric tons or 19.3 per cent	112,650,000 metric tons or 80.7 per cent
Wheat production	1,744,000,000 bushels or 29.1 per cent	4,254,000,000 bushels or 70.9 per cent

"Just as an American president with the Monroe Doctrine stopped the Russians in 1823 after the Czar had notified the world that Russia was reserving to herself the whole region of North America as far south as the 51st parallel and that she was closing that immense region to all foreigners, so the United States now must stop Russia by exercising positive and vigorous world leadership to marshal into an effective team the great predominance of human, material and natural resources which are today free of Communist controls," said Mr. Mundt.

It is necessary, he declared, to restate American foreign policy—and he warned that we are going to fail to stop Communism if we rely alone upon American dollars to do the job. What we need, he said, is a complete cessation of prevailing appeasement practices, and a revamping of Article 51 which will assure effective co-operation of the non-Communist nations.

"The Monroe Doctrine of 1823," he said, "should be expanded and rephrased to become the American Doctrine of 1948. By such positive action alone, can we avoid disastrous war."

Tax Cut Premature—The speech about the fiscal outlook was by that veteran congressional hand, Marcellus C. Sheild, former clerk of the House Appropriations Committee. First he pointed out that the long-range trend of government expenditures has been ever upward, so that occasional periods of halts or decreases are quickly followed by a resumption of the upward trend. Since 1914 the upward trend has been tremendously accelerated—first by the expenses of World War I, next by the depression of the 30s, again by the expenses of World War II—and now by the expenses incurred in rearming.

So, conversation about reducing the cost of government, said Mr. Sheild, is just that—merely conversation. Congress, he pointed out, at no time has sought to cut the President's 1949 budget request by more than 5 per cent; reductions, he declared, are just not in the cards when the overall national situation is reviewed.

There is less inefficiency and waste in the cost of government than is popularly believed, he went on. The big items in our budget arise out of war—the cost of waging war, the cost of rehabilitation and care for the veterans after the war; then the cost of maintaining the ever expanding defense establishment which is imperative in today's conditions and, finally, the cost of carrying the war-created debt.

Later, on checking with the Bureau of the Budget, STEEL obtained the following latest estimates of the fiscal 1949 approximate actual expenditures under the major heads: National defense $13 billion; cost of veterans $6.2 billion; interest on the national debt $5.2 billion; cost of our foreign activities including ERP $7.4 billion; cost of social security system $2 billion; tax refunds $2 billion; public health and welfare $2 billion.

That, on the basis of the President's request of $39.7 billion, plus $3.5 billion, or a total of $43.2 billion, leaves $5.4 billion for all other costs of government—for running all the departments, agencies, federal courts and so on that serve the normal peacetime needs of the country.

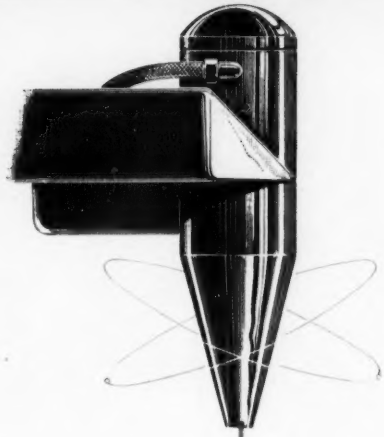
Unfortunately, that is not all. The 70-group air program alone will push expenditures up an even $1 billion in fiscal 1949 and a lot more in subsequent years. Additional billions are in sight for increases in our armed personnel and for universal military training. Further increases in other directions are possible.

Little Pessimism—With the business outlook continuing bright, no undue degree of pessimism resulted from Mr. Sheild's frank warning that government expenses will continue heavy. In fact, realistic Charles O. Hardy, staff director of the important Joint Committee on the Economic Report, pointed out that "the record of the past three years is one of full employment and high production; we have raised the standard of living of the mass of the population, greatly increased domestic investment and broken all peacetime records for net exports; at the same time the government has balanced its budget and paid off a small fraction of its debt. Such inflation as we have had is a small price to pay for the economic achievements of 1945-1948. And in doing this we have maintained an island of freedom in a world that is rushing to political and economic authoritarianism."

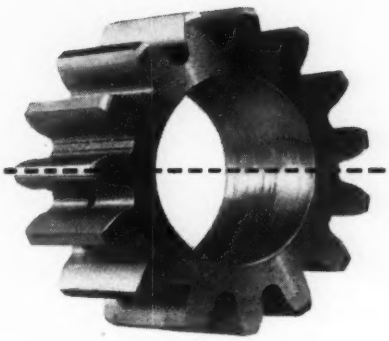
In other words, we are getting something for our money, Mr. Hardy thought.

Inventory of Deficits

It will be several months at least before the President's Council of Eco-



an eye for a tooth



The eye does it: the electronic temperature control in the Cincinnati Flamatic Hardening Machine keeps constant watch over surface temperatures, gives you better control of the finished product, lower distortion, and best uniformity with high production than ever before practical with flame hardening . . . Place the gear (other work – pinions, shafts, cams, etc.) on the spindle, press the button, and Flamatic does the rest: quickly heats the surface with oxy-acetylene flames to within plus or minus 5°F of preset temperature, followed by oil quench. Maximum surface hardness can be developed with negligible distortion and without affecting core properties . . . Considering size capacity, versatility, and productivity, Flamatic is definitely low in cost. Check Flamatic for your specific surface hardening requirements.

PATENTS PENDING

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ERP "WATCHDOGS": Congressional committee of ten men appointed to serve as "watchdogs" for the European Recovery Program meets in Washington. Standing, left to right, are: Rep. Clarence Cannon (Dem., Mo.); and Rep. John M. Vorys (Rep., O.). Seated: Sen. Tom Connally (Dem., Tex.); Sen. Pat McCarran (Dem., Nev.); Sen. H. A. Smith (Rep., N.J.); Sen. Styles Bridges (Rep., N.H.), chairman; Rep. John Tabor (Rep., N. Y.); Sen. Henry Cabot Lodge Jr. (Rep., Mass.). Two members of this congressional "watchdog" committee who are missing are Rep. Sol Bloom (Dem., N.Y.) and Rep. James Fulton (Rep., Pa.) NEA photo

nomic Advisors will be able to complete its list of the deficits in our national resources. This report is needed for two purposes: To indicate those industries in which home production must be expanded, and to give a better basis for the national stockpiling program.

The council needs more exact data as to how much of an impact on our domestic supplies will be made by the European reconstruction program. But it particularly needs to have a definite understanding of what part of our resources will be called for in carrying out the rearmament program on which we now are embarking. This particular chore is up to the National Security Resources Board which cannot complete its report until it gets a bill of particulars from the National Defense Establishment which, in turn, will be unable to report in advance of action by Congress as to how much steel, copper, manganese and so on the rearmament program will require. Even then, the program as it is authorized this spring by Congress will be subject to revision and expansion over the next year or two, so that estimates of the impact on our resources will have to be revised at occasional intervals.

The council, however, is eager to set up some sort of a preliminary inventory of deficits—one that will serve for a study as to the size and diversification of the needed expansion, and also to determine how much of the expansion program can be carried out by private industry and how much should properly be financed in some manner by the federal government.

ERP To Use Trade Channels

Procurement of supplies under the Foreign Assistance Act will be handled to the greatest possible extent through private trade channels because the re-establishment of normal trade relations is essential to world economic recovery, Paul G. Hoffman, ECA administrator, announced recently.

Explaining procurement procedures, he pointed out that first the governments of the participating countries will be asked to submit through the Organization for European Economic Co-operation overall schedules of requirements, including those to be financed both with ECA funds and with their own dollar resources. These schedules will be reviewed carefully by the ECA and other interested government agencies and revisions made where necessary to prevent undue impact upon our own economy and to make certain that ECA funds are conserved and spent only for those supplies which will contribute most to economic reconstruction and recovery.

After the schedules of requirements have been approved and arrangements made for the issuance of necessary export licenses, the participating countries will be authorized to start procurement. The countries involved, either through their governments or private business firms, will then be free to make such arrangements as they desire with private American exporters and manufacturers. American firms make their own contacts with European purchasers. While normal payments for legitimate services in connection with procurement are permitted, the ECA and other government agencies will seek to prevent foreign purchasers from paying unnecessary or exorbitant fees or commissions.

Private business firms in the participating countries will be able to finance specific purchases within the ECA-approved program through credits extended by U. S. Commercial banks on the basis of letters of commitment issued by ECA. However, they will be permitted to make use of these dollar credits only upon equivalent payments in their own currencies to their respective governments or central banks.

For the time being some government procurement under the Foreign Assistance Act is necessary, but for this purpose the ECA is relying entirely on existing government agencies, such as the Commodity Credit Corp., the Quartermaster Corps and the Bureau of Federal Supply. Some of the participating countries, because of internal conditions, must, temporarily at least, rely on U. S. government procurement agencies. This is true in the case of Greece and applies to Bizonia and Austria as well.

Industry Restudying Pricing Policies

Supreme Court decision in cement case, outlawing use of basing point and similar systems, places pricing methods in use in many industries in jeopardy

FEDERAL Trade Commission's hearing of the complaint against the pricing system in the steel industry was resumed last week with Walter S. Tower, president, American Iron & Steel Institute, recalled to identify copies of letters and other data obtained under subpoena from the files of the institute.

While the proceedings in the steel case went on much as before the recent Supreme Court decision outlawing use of multiple basing point pricing in the cement industry, this decision was reflected indirectly. For example, the trial examiner appeared more liberal than previously in admitting documents for the record over objection of steel industry attorneys.

Sees Similar Steel Ruling—Lynn C. Paulson, trial attorney for FTC, made no reference to the cement decision during the steel hearing, but he told a representative of STEEL in an interview that in his opinion the cement decision clearly foretold eventual similar outlawing of the steel pricing system. He said, speaking entirely on his own responsibility, and not for the FTC, it should be an easy matter for steel producers to get in the clear.

"The cement decision," he said, "may be construed as a mandate to the steel companies to establish prices at their mills and to offer to sell f.o.b. mill whenever requested to do so by customers. These seem to be the two outstanding changes indicated by study of the decisions in the cement, Staley and Corn Products cases."

F.O.B. Selling Not Mandatory—Mr. Paulson held that the decisions outlaw systematic freight absorption but do not ban freight absorption per se to meet competition. Hence it would seem that an exclusive policy of f.o.b. mill selling is not mandatory. In fact, Mr. Paulson said he personally felt that it would be beneficial for producers to compete for business outside their immediate territories as that is bound to benefit the consumer.

He pointed out the need for refraining from a systematic policy of meeting competitors' delivered prices and he said that he thought that any producer by using ordinary intelligence should be able to sell his product at prices and under policies not frowned upon by the commission or courts.

Point Needs Clarification—Federal Trade Commission spokesmen say there is one point that remains to be cleared up and that is the policy of many manufacturers to sell their product at a single delivered price over wide areas and in some cases throughout the country. FTC associate counsel Walter B. Wooden told STEEL that in his opinion the legality of a single delivered price policy irrespective of variations in the actual freight seems to come more under question as a result of the cement, Staley and Corn Products decisions which favor an f.o.b. mill pricing system.

A surprise move at resumption of the steel case hearing was the introduction of Mr. Paulson of the steel institute's manual on refractory and firebrick specifications. This manual, he said, would show that the steel industry practices "co-operative action" in the purchase of raw materials as well as in the sale of finished steel products.

Seeks Shipment Data—Mr. Paulson met with objection when he sought to obtain from the institute a copy of a tabulation setting forth the shipments of each finished steel product by each individual steel company in 1947. He wanted this information, he explained, to show which companies, on the basis of actual shipments, are the leaders in the various products.

Mr. Tower explained that these statistics are reported to the institute in confidence and, therefore, cannot be divulged by the institute.

Mr. Paulson said he hopes to get co-operation from the institute in tabulating the 1947 shipments of each steel product by each producer, and failing that he will employ subpoena powers to obtain the information.

In line with their usual caution in discussing plans for enforcement of the laws against illegal pricing systems, Federal Trade Commission spokesmen are unwilling to talk specifically about possible future proceedings against industries that, in the light of the cement decision by the Supreme Court on Apr. 26, now are eligible to be placed "on the carpet."

Questioned by STEEL as to "who is next on the commission's agenda?" Mr. Wooden declared many business firms will do well to "stop, look and listen" to determine whether they are using pricing methods that run afoul of the laws that ban collusion, discrimination and "unfair competition" in general.

Should Examine Practices—"All manufacturers in heavy goods industries where freight is an important part of the cost to consumers should examine their practices," said Mr. Wooden.

Other major heavy industries against which complaints have been uttered by the commission but against which cease-and-desist orders have not yet been issued include:

Cast Iron Soil Pipe Association and others; Chain Institute Inc. and others; National Lead Co. and others (white lead); Metal Lath Manufacturers Association and others; Structural Clay Products Inc.—separate complaints against eastern and western groups; Crouse-Hinds Co. and

PRICING SUSPECT

Just how many industries may have to review pricing policies as result of the Supreme Court ruling against multiple basing point and zone pricing in the cement case is uncertain. Some authorities think pricing in more than 600 industries is now suspect. However, Federal Trade Commission spokesmen told STEEL they did not know specifically all of the trades using multiple or zone pricing.

In addition to iron and steel, typical industries using such pricing are said to include lumber, glass containers, builders' supplies, farm equipment, ice, road machinery, paint and varnish, business furniture, liquefied gas, auto parts, ladders, paper and pulp, structural clay, china and porcelain, reinforcing materials, vitrified clay soil pipe, anti-friction bearings, bolts and nuts, some wholesale food and grocery products, construction machinery, lye, and wholesale coal.

others (traffic signals, etc.); Clay Products Association and others (refractory products); Clay Sewer Pipe Association Inc.; American Iron & Steel Institute and others (steel products); Fir Door Institute and others; Douglas Fir Plywood Association and others.

Three cases in which cease-and-desist orders were issued await court action. One is the celebrated Pittsburgh Plus case against the United States Steel Corp. This is in the Third Circuit Court of Appeals, Philadelphia, and may be argued this summer. The other two, against the Rigid Steel Conduit Association and Allied Paper Mills and others are in the Seventh Circuit Court of Appeals, Chicago.

Not Much Support—On Capitol Hill the plan to strip the Federal Trade Commission of its judicial powers and make it over into a purely prosecuting agency so far has not had much support and, on the other hand, has encountered forceful opposition. The O'Hara bill, under which the commission would be confined to bringing action against unfair practices in the federal courts, and would have to rely on court orders entirely, was the subject of two days of hearings by the House Interstate and Foreign Commerce Committee on Apr. 28 and 29. While hearings are to be continued at some date still to be set—probably around May 10, no strong support for the bill seems to be under development. Even some private practitioners have come out in opposition to the bill.

Prompted by receipt of an increasing number of letters and telephone calls from corporations and trade associations inquiring as to the status of pricing systems in various industries as result of the cement decision, the FTC is considering organization of a special committee to answer queries.

In a blanket comment issued by the "commission and its staff" on April 28, a statement appeared which caused some surprise to attorneys in private practice in Washington, who are predicting revolutionary repercussions to American industry if this view proves correct. In this comment the commission interpreted the Supreme Court as outlawing "the adoption for sales purposes of any basing point pricing system," and as classing freight absorption as well as phantom freight as a violation "if competition is injured or destroyed."

Cement Policy Undecided—Cement industry spokesmen are not yet prepared to say exactly what they will do. However, it is likely they will resort to somewhat similar solutions as those decided on by Corn Products Refining Co. and the A. E. Staley Co. in carrying out the cease-and-desist orders which were sustained against the latter by the Supreme Court in 1945.

The compliance replies of these companies should be of wide interest in view of the fact that many industries not so far proceeded against have somewhat similar pricing systems and might benefit from knowing what Staley and Corn Products did in compliance.

Corn Products Compliance—In a report of compliance dated Sept. 24, 1945, the Corn Products Refining Co., and Corn Products Sales Co., 17 Battery Place, New York, said: "Respondents have, in all respects, fully complied with aforesaid order to cease and desist, as modified, and will continue to do so."

The report reviewed the Federal Trade Commission order of Mar. 16, 1942, which charged unlawful practices under section 2 of the Clayton Act as amended by the Robinson-Patman Act. and under section 3 of the said Act.

The Corn Products compliance report then reviewed the progress of the case by which the Circuit Court of Appeals for the Seventh Circuit handed down a decree on Sept. 18, 1944, which was affirmed by the United States Supreme Court on April 22, 1945.

Compliance Cited—"Respondents," said the compliance report, "have ceased any and all acts forbidden by the cease and desist order, as modified. More particularly: 1—(a) Since Sept. 25, 1941, and at the present time, respondents' delivered price of glucose or corn syrup unmixed in tank car lots sold in interstate commerce to all buyers at any destination has been, and is, arrived at by adding to a base price the published local rail freight rate to that destination from the plant of respondents, either Argo (Chicago), Kansas City, Mo., or Pekin, Ill., from which the local carload freight rate is lowest; except that where the local freight rate to a destination from the plant of a competitor has been or is less than the local freight rate to that destination from either Argo, Kansas City or Pekin, and the competitor has quoted or now quotes a lower price than would be the price of respondents arrived at as above described, respondents have met or are meeting such lower price of such competitor. (b) Since Sept. 25, 1941, and at the present time respondents' delivered prices of glucose or corn syrup unmixed sold and delivered to buyers at any destination in quantities less than tank car lots, namely, in tank wagon or in barrels, half barrels, kegs or returnable steel drums, have been and are arrived at by adding to their tank car price at such destination arrived at as above described in sub-paragraph (a) their regular so-called container differentials currently in force at such destination;

"2—Since the date the commission made its order of Mar. 16, 1942, respondents have not allowed, and they do not now allow, in the event of a change in prices, any buyers of glucose or corn syrup unmixed more

(*Please turn to Page* 157)

Calendar of Meetings . . .

May 10-12, Canadian Association of Equipment Distributors: Fifth annual convention, General Brock Hotel, Niagara Falls, Ont.

May 11-12, American Steel Warehouse Association: 39th annual meeting, Drake Hotel, Chicago. Association president is Walter S. Doxsey, 442 Terminal Tower, Cleveland.

May 13-14, American Management Association: Production conference, Palmer House, Chicago. Association headquarters are at 330 W. 42nd St., New York.

May 14-23, Buffalo Chamber of Commerce: Buffalo industrial progress exposition, 65th Regiment Armory, Buffalo. Chamber headquarters are at 238 Main St., Buffalo.

May 15-22, International Petroleum Exposition: Texas Bldg., Tulsa, Okla.

May 16-22, Chamber of Commerce of the United States: World Trade Week. Associated with the promotion of the week is Kenneth H. Campbell, manager of Foreign Commerce Department.

May 19, Bituminous Coal Research Inc.: Annual meeting, Columbus, O. Group's headquarters are at 912 Oliver Bldg., Pittsburgh.

May 20-21, National Welding Supply Association: Annual convention, Sheraton-Coronado Hotel, St. Louis. Association headquarters are at 505 Arch St., Philadelphia.

May 20-21, Society of the Plastics Industry: Annual meeting, Atlantic City, N. J. Society headquarters are at 295 Madison Ave., New York.

May 24-25, National Association of Sheet Metal Distributors: Spring meeting, Deshler-Wallick Hotel, Columbus, O. Association executive secretary is Thomas A. Fernley Jr., 505 Arch St., Philadelphia.

May 26-27, American Iron & Steel Institute: 56th general meeting, Waldorf-Astoria Hotel, New York. Institute headquarters are at 350 Fifth Ave., New York.

May 27-29, Automotive Engine Rebuilders Association: 1948 annual convention, Hotel Statler, Buffalo. Association headquarters are at 415 N. Capitol Ave., Indianapolis.

May 27-29, Society for Experimental Stress Analysis: Spring meeting, Roosevelt Hotel, Pittsburgh. Society address is P.O. Box 168, Cambridge, Mass.

May 31-June 2, National Association of Purchasing Agents: Annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Pl., New York.

May 31-June 5, American Society of Mechanical Engineers: Semi-annual meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

June 11-12, American Society of Metals: Sixth biennial Pennsylvania interchapter meeting of groups located wholly or partly in the state, State College, Pa.

Kettering To Speak at AISI Convention

CHARLES F. KETTERING, General Motors Corp., will deliver the Charles M. Schwab Memorial Lecture at the 56th general meeting of the American Iron & Steel Institute which convenes May 26 and 27 at the Waldorf-Astoria, New York.

At other sessions speakers will be Walter S. Tower, president of the institute; David F. Austin, vice president, United States Steel Corp.; Dr. Claude Robinson, president, Opinion Research Corp. and Sen. Joseph H. Ball of Minnesota. The latter will discuss "Practical Results Achieved Under the New Labor Management Relations Act of 1947."

Six Technical Sessions — Another feature of the convention will be six technical programs on operating and metallurgical problems. J. B. Mitchell, vice president, Jones & Laughlin Steel Corp., will be chairman of the session on coal and coke. Papers to be presented include "Modern Mechanized Mining and Coal Preparation for Metallurgical Coal," by John Griffen, McNally - Pittsburg Mfg. Corp.; "Proper Sizing, Screening and Preparation of Blast Furnace Coke," by C. A. Covington, superintendent, Campbell Coke Plant, and D. P. Cromwell, superintendent, blast furnaces, Campbell Plant, Youngstown Sheet & Tube Co.; and "Effects of Coke Quality on Blast Furnace Iron Tonnage," by E. J. Gardner, superintendent, blast furnaces and coke plant, Inland Steel Co.

The session on oxygen in steelmaking has as its chairman, S. J. Cort, vice president, Bethlehem Steel Co. Among the papers on this subject will be "Tonnage Oxygen for Increased Iron and Steel Production," by J. H. Strassburger, manager, department of service and maintenance, Weirton Steel Co.; "Some Practical Aspects of Direct Oxidation in the Basic Open Hearth Process," by Frank G. Norris, statistical metallurgist, quality control department, and Edward B. Hughes, foreman, open hearth metallurgy, quality control department, Wheeling Steel Corp.; and "Use of Oxygen for Decarburization and Melting in the Electric Furnace," by J. H. Eisaman, superintendent, No. 2 electric furnace, Carnegie-Illinois Steel Corp.

Sources of Iron—E. M. Richards, vice president, Republic Steel Corp., will be chairman of the program on sources of iron. Papers on this subject include "Experience to Date on Iron Production by Methods Other Than Coke Blast Furnace; Direct Reduction," by Earle C. Smith, chief metallurgist, Republic Steel Corp.; "Future Source of Iron Units in Scrap," by Charles R. Holton, vice president, Bethlehem Steel Co.; and "The Preparation of Iron for Blast Furnace and Open Hearth Use," by Robert R. Williams Jr., superintendent of blast furnaces, Colorado Fuel & Iron Corp.

Chairman of the session on refractories will be J. E. Lose, vice president, Carnegie-Illinois Steel Corp. Papers to be presented in this field include "Factors in Service Behavior of Silica Brick," by L. A. Smith, refractories engineer, Jones & Laughlin Steel Corp.; "Basic Brick in the Open Hearth Furnace," by Vernon W. Jones, open hearth superintendent, Armco Steel Corp.; "Properties and Performance of Open Hearth Bottoms," by H. M. Kraner, ceramic engineer, research department, Bethlehem Steel Co.; and "Some Consideration in the Use of Carbon as a Refractory in the Blast Furnace," by W. S. Debenham, ceramic engineer, Carnegie-Illinois Steel Corp.

Specialty Steels—In the program on specialty steels, F. B. Lounsberry, vice president, Allegheny Ludlum Steel Corp., will be chairman. Papers on this subject will be "Effect of Composition on Low Carbon Austenitic Chromium-Nickel Stainless Steels," by G. C. Kiefer, associate director of research, and C. M. Sheridan, associate director of research, Allegheny Ludlum Steel Corp.; "On the Structure of the High Temperature Metals," by Russell Franks, chief metallurgist, technical service and development department, Electro Metallurgical Co.; and "The Metallography and Properties of High Alloy Hot Work Steels," by Peter Payson, assistant director of research, and A. E. Nehrenberg, assistant supervisor, Harrison Research Laboratory, Crucible Steel Co. of America.

The session on coating and finishing will be presided over by F. H. Fanning, assistant vice president, Armco Steel Corp. Papers in this field will include "Continuous Coating," by Forrest M. Morrow, superintendent, galvanizing department, and K. Oganowski, assistant director, research laboratories, Armco Steel Corp.; "Continuous Strip Pickling," by E. D. Martin, research metallurgist, Inland Steel Co.; and "Batch-Type Annealing," by P. A. Karns, superintendent, cold-rolled products department, and W. E. Harvey, chief metallurgist, John A. Roebling's Sons Co.

Facts for Industry . . .

(As reported by government agencies)

Housing-Type Trailers—Production of housing-type trailer coaches was 4131 units in February, compared with 4305 in January. Shipments totaled 3963 units, valued at $6.8 million, compared with 4089 units and $7.2 million in January. Shipments continued the decline begun last November and are now at the lowest level since July, 1946. *Census Bureau, Commerce Dept.*

Warm Air Furnaces — Factory shipments of warm air furnaces dropped to the lowest level in two years in February at 36,354 units. This was a 22 per cent decrease from January. Of the total shipped, 53 per cent were for solid fuel combustion, 26 per cent for gas, and 21 per cent were oil-fired type. At the end of the month inventories of warm air furnaces reached 78,028 units, the highest since last July. Stocks were 11 per cent greater than at the end of January. *Census Bureau, Commerce Dept.*

Steel Shipping Containers — February production of heavy-type steel barrels and drums was 6 per cent less than January, at 2.1 million units; 10 per cent fewer light-type steel barrels and drums were produced for a total of 788,511; and 4.2 million steel shipping packages, kegs and pails were produced, compared with 4.6 million in January. *Census Bureau, Commerce Dept.*

Metal Cans—Shipments of metal cans in February totaled 202,539 short tons, a 6 per cent decline from the 216,530 tons shipped in January. Of the tonnage shipped, 169,980 tons or 84 per cent were for producers' own use. Nonfood containers accounted for 76,748 tons of the total, compared with 81,859 tons in January. *Census Bureau, Commerce Dept.*

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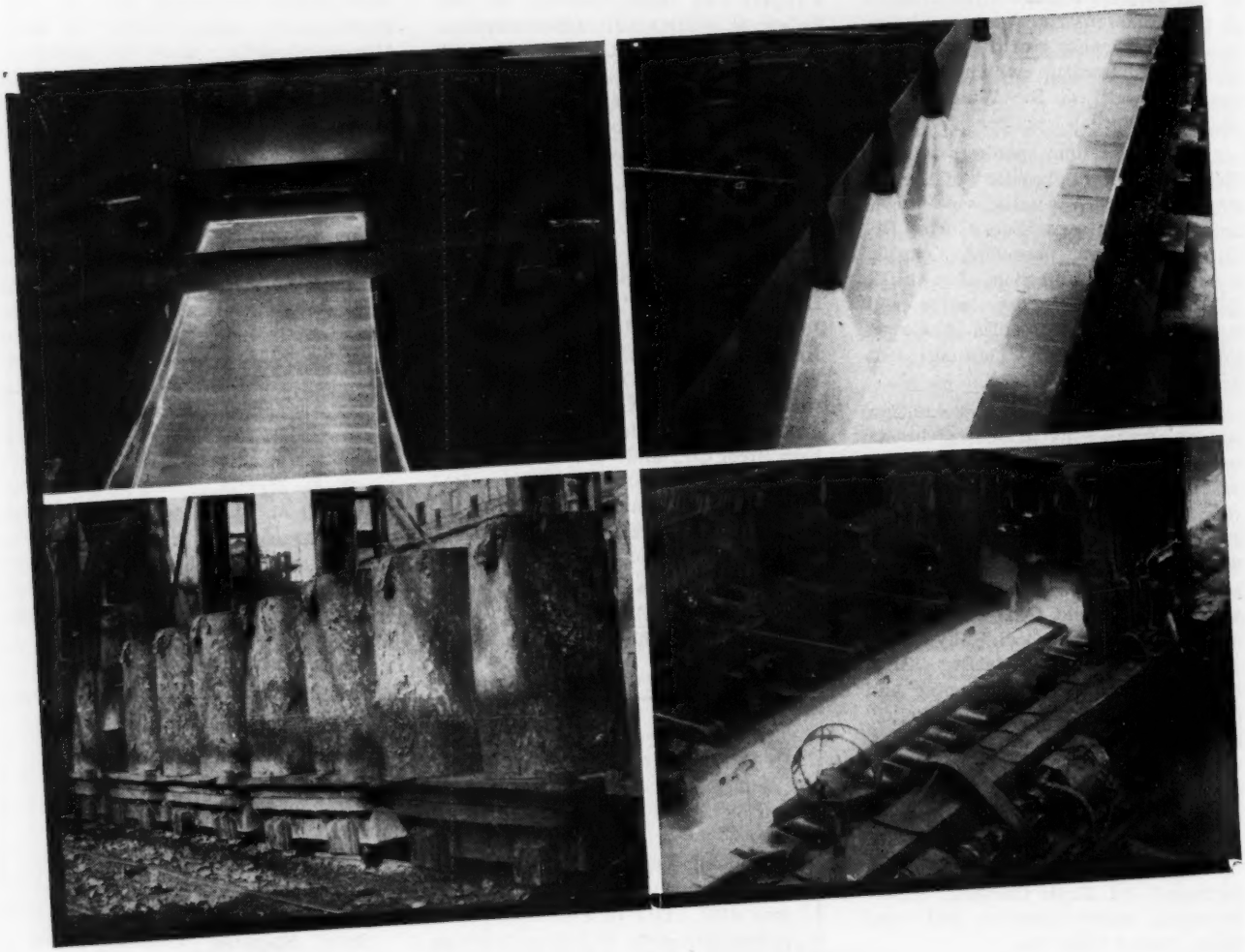

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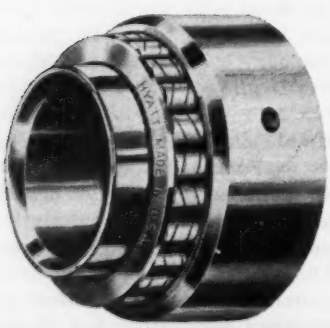

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HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

United Auto Workers puts finger on Chrysler in drive for third round wage increases. Strike may start this week. Ford union seeks huge raise and benefits

DETROIT

FINGER of the United Automobile Workers—CIO appears to be firmly on the Chrysler Corp. and as of this writing it looks like corporation plants will be struck this week (May 12) in support of demands for the equivalent of around 35 cents an hour wage increase. In its latest publicity, the UAW has avoided any mention of an exact figure for a wage increase, leading to the suspicion that it has scaled down original proposals. The technique obviously is to bludgeon through a national pattern at Chrysler if possible, and then follow on right down the line through all automotive and parts plants as was done in the past two years when other manufacturers were the guinea pigs.

Eyes and ears of all industry are turned toward Chrysler, although there has been nothing emanating from the company but stony silence, except for one offer of a 6-cent increase, which was rejected and then withdrawn, and the comment by a Chrysler official to the effect lowered income taxes would be the equivalent of a 4-cent hourly increase in take-home pay. Costly though a strike may be, there is little likelihood the company will relax much from its position, and there is not much chance a strike, however long it may wear on, will be productive of a wage increase anywhere near what the UAW is asking. Actually, the union would settle at once for an 18-cent raise.

Ford Union Asks Raise—To add a little comic relief to the wage situation, the Ford local of the UAW last week announced it would seek a 30-cent hourly increase, a pension plan, a health insurance plan, three-week vacations, a guaranteed weekly wage, reinstatement of paid lunch periods or an extra 5 cents an hour, equalization of pay rates in all plants, a 10 per cent bonus for night shift employees and an employee discount on new car purchases—totaling up to the equivalent of a 50-cent boost. The pension plan, rejected last year by Ford employees, would be financed by setting up a fund, involving a specified amount for every car built. The Ford contract may not be reopened on economic issues until July 15, although bargaining sessions will be requested late this month.

The Michigan attorney-general has ruled the state's Bonine-Trippe Relations Act requires a state-supervised poll of all employees of a bargaining unit before a strike may be called, and this would apply to the Chrysler dispute. However, the union contends provisions of the act do not apply to companies in interstate commerce and hence it will proceed with strike plans. A poll of the 75,000 Chrysler employees could not possibly be completed before May 12, and the union's plan to ignore the act doubtless indicates a court test is being sought.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,277	366,205
February	399,432	393,636
March	519,112	443,588
April	458,950*	445,137
May		404,191
June		421,466
July		400,944
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
April 17	104,761	105,337
April 24	107,093	102,447
May 1	102,039	101,690
May 8	85,000	94,756

Estimates by Ward's Automotive Reports

Other Companies Watching — Developments in the Chrysler-UAW squabble are of major importance to a number of other automotive and parts companies where union groups are affiliated with the east side local of the UAW-CIO. They include Briggs Mfg. Co., Hudson, Packard, Motor Products and others. Should Chrysler plants go out on strike, it is probable these other plants also would find picket lines around their gates in short order. By the same token, whatever the union can pry out of Chrysler in the form of a wage increase will have to be met by the other units. Some of them are negotiating now, but it is merely a matter of waiting for Chrysler developments.

An interesting angle is that the publicity release from the UAW announcing the Chrysler strike call for May 12 was released Apr. 30 and evidently had been mimeographed some days in advance, except for the actual date of the strike. The latter had been inserted at the last minute. In other words the union policy committee had sanctioned strike action before any date was decided upon.

Fringe Concessions Large — Probably few employees, or employers either for that matter, realize the mounting portion of wage payments involved in so-called "fringe extras" or hidden payroll costs, as the Automotive & Aviation Parts Manufacturers Inc. terms them. The AAPM has been conducting a detailed survey over the past year to determine just what these extras amount to and the summary of returns from 198 plants indicates that collateral payments made to, or for the direct benefit of hourly-paid employees cost more than 12½ cents per hour, over and above direct wages, for every man-hour worked. Furthermore the overall average cost is approximately 38½ per cent higher than it was in 1946, and this year will be still higher, since many companies now granting pay for unworked holidays did not do so throughout last year.

Companies reporting in the survey furnished nearly 360,000,000 man-hours of work to factory employees in 1947 or the equivalent of approximately 180,000 man-years of work at 2000 hours per man per year, and paid out in excess of $45 million for collateral items. On the basis of 2000 man-hours per year, the collateral cost figures to $250 per man or, if spent in direct wages at $1.50 per hour, would have purchased 30,000,000 man-hours of work.

Figures Conservative—AAPM estimates the figures are conservative. For one thing, no figures were requested on expenditures which might be considered controversial — paid lunch periods, for example. In addition, all reports were not complete, thus diluting the overall costs of collateral payments. What were included were vacation payments, bonuses or other profit-

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BRITISH CONVERTIBLE: Sir William Rootes, chairman of the Rootes Group, British auto manufacturers, explains the features of this new 1948 Hillman Minx convertible. Distribution in the United States is planned. NEA photo

sharing payments, wages for holidays not worked, payments to union stewards for time spent in settling grievances or in negotiating agreements, employers' shares of legally required payments such as old-age insurance, unemployment compensation, etc., and voluntary payments covering such items as pension plans, life insurance premiums, sick-leave pay, hospitalization insurance and death benefits not covered by insurance.

As stated, the overall average total was 12.543 cents per hour. Some companies reported as high as 35 cents an hour, the higher figures usually being associated with plants offering profit-sharing plans. Figures also were broken down by geographical area. Sixty-nine plants in the Detroit area averaged 13.616 cents per hour; 37 plants in Michigan outside Detroit averaged 11.028 cents; 75 plants in Ohio, Indiana, Illinois, Wisconsin and other states west of Ohio showed 12.219 cents; and 17 plants in New York, Pennsylvania and other states east of Ohio reported 12.860 cents. Copies of the latest survey may be obtained from the AAPM, 800 Michigan Building, Detroit 26.

GM Resumes Operations

Manufacturing divisions of General Motors resumed operations last week after a one-week closing resulting from exhaustion of pig iron, coke and some steel inventories. Result was not immediately reflected in car and truck assemblies although it ultimately will be as many assembly units suspended for a week because of the interruption of the flow of parts from manufacturing units. The equivalent of about a full week's production, or around 40,000 units, probably will be lost. Meanwhile, depletion of sheet and strip stocks at Briggs plants shut off bodies going to the Plymouth Division of Chrysler, resulting in a week's stoppage and the loss of better than 10,000 cars.

Packard Output Up

At the same time, Packard was ringing up a new postwar production record for the second month in a row, building a total of 9269 units in April, comparing with 8757 in March. Assembly rate on two final lines was boosted to 55 cars an hour in mid-April, and a further increase was made last week, to be followed by still another in June. Ample supplies of body steel are now being shipped to Briggs for the Packard account, and the company built 27,206 cars in the first four months of this year, despite the loss of 14 working days in the first two months. The total compares with 16,020 units produced in the like period a year ago. Output this year should pass the 100,000 mark, or close to double the 55,477 built last year.

The company's financial position, as a result, moved well into the black area. Consolidated net income for the first quarter was $1.3 million, after provision of $800,000 for taxes. Some observers feel that once Packard establishes a good earnings record, the time may be ripe again to reconsider the feasibility of effecting the much-discussed merger between Packard and Nash, which has been more or less dormant for several months.

Looking to the future, Earl H. Smith, Packard experimental and development engineer, observes that although the modern automobile rides far more smoothly than those of a few years ago, "there is actually no limit to the improvements that can and will be made in the car-ride of the future." He calculates the improvement in riding qualities of Packard at about 25 per cent since 1940. Further improvement hinges on unceasing experiments aimed at a finer balance between tires, springs, shock absorbers, cushion springs and general car rigidity.

Ford Starts 1949 Runs

Initial assemblies of the 1949 Ford during the last week in April ran to about 500 and this month's schedules call for 12,000, although it is problematical if sufficient materials and parts will be available to meet projections. First day's output (Apr. 26) was 12 two-door sedans.

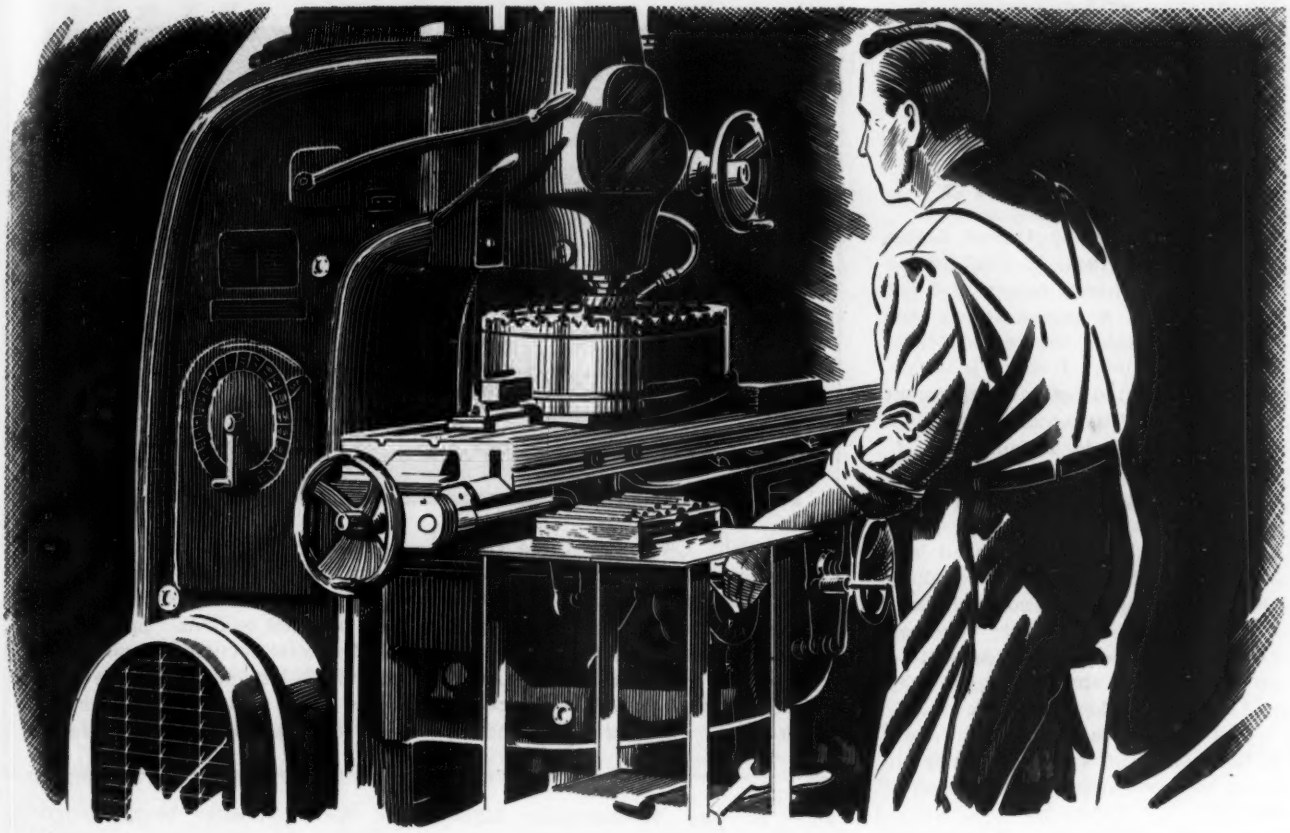
Production foundry at the Rouge will not resume operating until this week following a two-week closing for renovation. Extra crews have been at work on clean-up jobs in pits and elevator shafts, removing dirt and grime from roof girders, installing cinder catchers on cupolas, and overhauling sand handling equipment. Sand now being brought into the building is blended with damp sand to give moisture content of around 2 per cent and reduce dust conditions.

Ford's foundry sand stockpile at nearby Melvindale covers 45 acres and represents well over a year's requirements. This summer the desert-like area will be built up with another 531,000 tons, hauled in by boats to the Rouge docks and shipped by rail to the storage tract. Last year the production foundry used 315,662 tons of five types of foundry sand. Bulk of the material is sharp sand from the Lake Michigan dunes.

West Coast Plants Open

New West Coast passenger car and truck plant of the Dodge Division of Chrysler was formally opened last Tuesday at San Leandro, Calif., with company officials in attendance. Plant has about 300,000 square feet of floor space and capacity will be approximately 150 passenger cars and 80 trucks per 8-hour day. Thus far, only assemblies have been trucks.

Almost simultaneously, opening ceremonies were conducted for the new Lincoln-Mercury plant in Los Angeles, with top Ford and L-M executives on hand for the usual California-style hoopla.



What's Interesting About UNION CHAIN'S Manufacturing?

Union Chains for Every Application

Drive and Conveying Chains and Sprockets

- Bridge Chain
- Combination Malleable Iron and Steel Chain
- HB (hardened bearing) type chain
- BP (bar and pin) type chain

★

Finished Steel Roller Chains and Sprockets

- All manufacturer's standard, size ⅜ in. to 2½ in. pitch
- Single and Multiple Strands
- Extended Pitch Series in sizes 1¼ in. to 4 in. pitch

★

Silent Chain and Sprockets

- All sizes ⅜ in. to 1½ in. pitch

★

Flexible Couplings

- Roller chain type
- Silent chain type

Every man, every machine, every tool and every method in our modern straight-line plant is there for only one purpose: the manufacture of steel sprocket chain and attachments for the transmission of power and the mechanical handling of materials. In view of the number of precise and complicated operations involved in the manufacture of every single pitch of steel sprocket chain, it is not surprising that our customers, both present and future, find such specialization interesting—and valuable.

The Union Chain and Manufacturing Company

TRANSMIT POWER
UNION CHAINS
CONVEY MATERIALS

Sandusky, Ohio, U.S.A.

Price Changes Explained to Stockholders

NET EARNINGS by United States Steel Corp. in 1947 of $127,098,148 were equivalent to a return of 6 per cent on sales, a comparatively low return, considering the record peacetime production, Irving S. Olds, chairman, pointed out in a statement read at the 47th annual meeting of the stockholders in Hoboken, N. J., May 3.

The meeting was the longest on record, lasting three hours. Three hundred stockholders attended and enlivened the meeting by making numerous proposals and comments from the floor. Enders M. Voorhees, chairman of the finance committee, presided in the absence of Mr. Olds and read Mr. Olds' statement.

Last year's earnings were about $70 million less than in 1929, although sales last year were double those of 1929.

In 1947, 42.6 cents of the sales dollar went for employment costs and 39.6 cents for purchase of goods and services. Stockholders received one-thirteenth as much as employees.

First Quarter Net Lower—During the first quarter of 1948, U. S. Steel earned a profit of $33,957,341, or $5,300,000 less than in the first quarter of 1947, despite the fact that shipments were 300,000 tons greater this year. This reflects rising costs.

Earnings for the second quarter will be adversely affected by the coal strike which cost the corporation production of 3,200,000 tons of coal, 430,000 tons of pig iron and 430,000 tons of ingots up to Apr. 25 and which still is causing lost output.

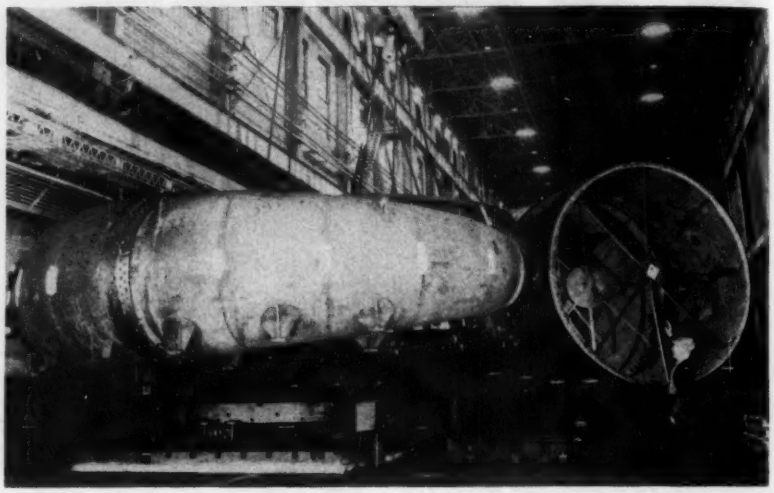
The management's statement reviewed recent price revisions by the corporation, including the February increase in semifinished steel and the April reduction on a broad range of finished steel products.

Stockholders Speak—J. Newcomb Blackman suggested that management disburse a larger share of earnings in dividends and finance expansion from borrowings. Mr. Voorhees replied that it would be extremely unwise for a company in the durable goods industry to borrow large sums at the top of a business cycle.

Philip Murray, president of the United Steelworkers, had been invited to the meeting by B. C. Forbes, president, Investors' League, to explain a belief that the corporation could cut prices sharply and still be able to pay substantially higher wages. Mr. Murray did not appear, but offered to supply the information desired through the union's research department.

Numerous other proposals were made by stockholders, but none was approved.

Nathan L. Miller, Irving S. Olds, George A. Sloan, Robert C. Stanley and Myron C. Taylor were re-elected to the directorate.



TURBINE CASING: Three cranes were used to lift this 180-ton spiral casing and speed ring for the fifth Shasta Dam hydraulic turbine to a 40-foot boring mill in the Allis-Chalmers shops, Milwaukee. Casing measures 50 feet across and is constructed in seven sections. Speed ring portion has an 18 foot inside diameter. The inlet section has an inside diameter of 12 feet 8 inches, and is made of 1⅞-inch plates. Upon completion, the unit will be shipped to join four other Allis-Chalmers turbines at Shasta, all rated 103,000 horsepower at 138½ rpm under 330 feet head

Fruehauf Officials Tour New, Expanded Facilities

Officers, directors and other top executives of Fruehauf Trailer Co. recently completed a first-hand inspection tour of the company's enlarged and modernized manufacturing facilities, formerly centered in Detroit but now removed from the motor capital.

The party, headed by Harvey C. Fruehauf, president, and Roy A. Fruehauf, executive vice president, visited plants at Avon Lake, O., Ft. Wayne, Ind., Kansas City, Mo., and Cedar Rapids, Iowa. At Avon Lake, near Cleveland, production operations are now under way in a new plant. Production of standard van-type trailers for all except West Coast users is being concentrated here.

The Ft. Wayne unit, which produces tank-trailers, dump trailers, carryalls and stainless steel trailers, recently has been enlarged by an addition which extends manufacturing space to a total of 260,000 sq ft. Fruehauf's Kansas City plant is back in operation after being completely retooled for the mass production of low-price, all-steel truck bodies.

At the Cedar Rapids plant, where machining operations are carried on, the group saw expanded facilities which have been added to produce parts for a gravity tandem suspension.

Inland Appeals Pension Bargaining Decision

Inland Steel Co. has filed an appeal from a recent decision of the National Labor Relations Board, in a determined effort to save the voluntary retirement plan which it has had in effect for more than 12 years. Appeal was filed in U. S. Circuit Court of Appeals for the Seventh Circuit, Chicago.

In a split decision on Apr. 13, the NLRB declared the company must bargain with the United Steelworkers of America-CIO over the age at which employees must retire, and over any fixed pension plan that the company offers its employees. The conditional order for Inland to bargain specified that the union file noncommunist affidavits. The union has refused to do so.

Inland has maintained that its retirement plan is not a proper subject for bargaining, under the terms of the National Labor Relations Act.

Since the board decision, the company has pointed out that there are 26 bargaining units with which it must deal.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Scully-Jones & Co., Chicago, manufacturer of standard and special production tools, has appointed the recently formed Production Tool Sales Co., 2 N. Dean St., Englewood, N. J., as its sales representative in northern New Jersey.

—o—

Association of American Railroads, Car Service Division, and **Great Lakes Regional Advisory Board** will move their Detroit district office and headquarters, respectively, to 505-6 Commerce Bldg., Detroit, on May 12.

—o—

Steelcraft Mfg. Co., Rossmoyne, O., has begun production of a prefabricated 50-ft wide, clear span building. This model is used for expanding manufacturing facilities, for storage or warehouse space, for display rooms or for recreational buildings.

—o—

Brainard Steel Co., Warren, O., subsidiary of Sharon Steel Corp., has purchased Tel-O-Post Co., Akron, which will continue operations in Akron as the Tel-O-Post Division of Brainard. Division will take certain of Brainard's products to market in further fabricated form.

—o—

Anker-Holth Mfg. Co., Pt. Huron, Mich., manufacturer of hydraulic cylinders, chucks and air valves, has been purchased by Jay Cresswell, president of Pneumatics Inc., Plymouth, Ind., maker of air cylinders and air valves.

—o—

Cowles Detergent Co., Cleveland, manufacturer of chemical detergents for metal cleaning and other uses, has completed a $1 million plant at Skaneateles Falls, N. Y., and production has already started.

—o—

Fresh'nd-Aire Co., Chicago, manufacturer of air conditioning equipment, has acquired additional manufacturing space at 2000 W. Fulton St., Chicago, and additional office area at 221 N. La Salle St., Chicago.

—o—

American Washer & Ironer Manufacturers' Association, Chicago, reports that sales of household washers hit an all time high in March, totaling 398,298 units, compared with 397,113 in October, 1947, and an increase of 10.5 per cent over the 360,029 sold in February, 1948.

—o—

Westinghouse Electric Corp., Pittsburgh, has cut prices 5 per cent on its single-phase watt-hour meters and electrical relays. Westinghouse has also reduced prices from 5 to 10 per cent on airport lighting equipment. Company earlier had announced similar reductions on fractional horsepower motors.

—o—

U. S. Navy has opened the new Michelson Laboratory at its Ordnance Test Station, Inyokern, Calif.

—o—

William M. Bailey Co., manufacturer of blast furnace equipment, has moved its general offices to 1221 Banksville Blvd., Pittsburgh.

—o—

Threadwell Tap & Die Co., Greenfield, Mass., manufacturer of taps, dies, cutters and counterbores, has appointed Rueger Co., Los Angeles, as exclusive sales representative in the 11 Rocky Mountain and Pacific Coast states and Hawaii.

—o—

Montreal Locomotive Works Ltd., Montreal, Que., and **Canadian General Electric Co. Ltd.,** Toronto, Ont., have joined forces to produce diesel-electric locomotives for Canadian railroads and for export.

—o—

Bureau of Reclamation, Department of the Interior, has installed the ninth hydroelectric generator, a 108,000 kw unit, in the west powerhouse at Grand Coulee Dam. Nine more will eventually be installed at the dam's east powerhouse. Three will be installed in 1949 and another three in 1950.

—o—

Federal Power Commission reports that a downward trend in U. S. average typical electric bills since 1924 was checked in 1947 in spite of the fact relatively few communities had any change in electric rates during 1947. Trend went upward because of the operation of fuel clauses which came into effect because of increases in coal and oil prices.

—o—

Oakland Chamber of Commerce reports 19 expansions and new industries in the Oakland, Calif., metropolitan area during March will involve an estimated capital investment and expenditure of $2,078,000.

—o—

U. S. Navy has acquired jurisdiction over the following government-furnished facilities: El Segundo, Calif., aircraft plant occupied by Douglas Aircraft Co.; Lester, Pa., research and development plant for gas turbine engines, occupied by Westinghouse Electric Corp.; Akron aircraft plant now used for reserve training and other Navy activities; Litchfield Park, Ariz., aircraft plant now used as a Naval air facility.

—o—

International Business Machines Corp., New York, reports man-hours per unit of production in IBM plants are now slightly lower than before the war and that the quality of work is the highest in company history.

—o—

Gerity-Michigan Corp., Detroit, manufacturer of die cast and plated parts for the automotive and other industries, has formed a new division to manufacture rubber seal for doors and compartments.

—o—

Clayton & Lambert Mfg. Co., Louisville, Ky., recently gave a preview of a gas-fueled, absorption-type household refrigerator perfected by the company after three years of research and development.

—o—

Van Norman Co., Springfield, Mass., builder of machine tools, has purchased Fitchburg Grinding Machine Corp., Fitchburg, Mass., producer of grinding machines for use in automotive and aircraft industries.

—o—

Commonwealth of Pennsylvania reports more than $596 million has been invested in new plants and equipment in the state since the war by 417 metal and metal product companies, including 26 basic iron and steel firms.

—o—

Acro Welder Mfg. Co., Milwaukee, manufacturer of welding and brazing machines, has been acquired by a group headed by J. C. Wilson, new president of the firm and formerly vice president of Burlington Mills Inc., Burlington, Wis.

—o—

Ore Steamship Corp., subsidiary of Bethlehem Steel Corp., Bethlehem, Pa., reports that its fleet of eight new bulk ore carriers will be in operation by the end of the summer to carry ore from Bethlehem's Venezuela properties.

—o—

Arcos Corp., research firm and producer of electrodes, has moved to 50th and Paschall Ave., Philadelphia.

—o—

Baldwin Locomotive Works, Eddystone, Pa., is completing a 4800-ton hydraulic press for delivery to Manhattan Rubber Division, Raybestos-Manhattan Inc., Passaic, N. J. Press will be used for vulcanizing rubber conveyor belts.

The Business Trend

CONTINUED RECOVERY of steel output from the curtailed rate necessitated by the recent disruption of coal mining is primarily responsible for a six-point jump that in the week ended May 1 put STEEL's industrial production index to 159 per cent (preliminary) of the 1936-1939 weekly average.

AUTOS—However, various steel consuming industries are now feeling the impact of the mining stoppage, the automobile producers, for instance, finding it necessary to shut down some assembly lines for want of steel. As a result, auto output in the week ended May 1 receded from the preceding week's 107,093 units to 102,039, lowest since the week ended Feb. 14.

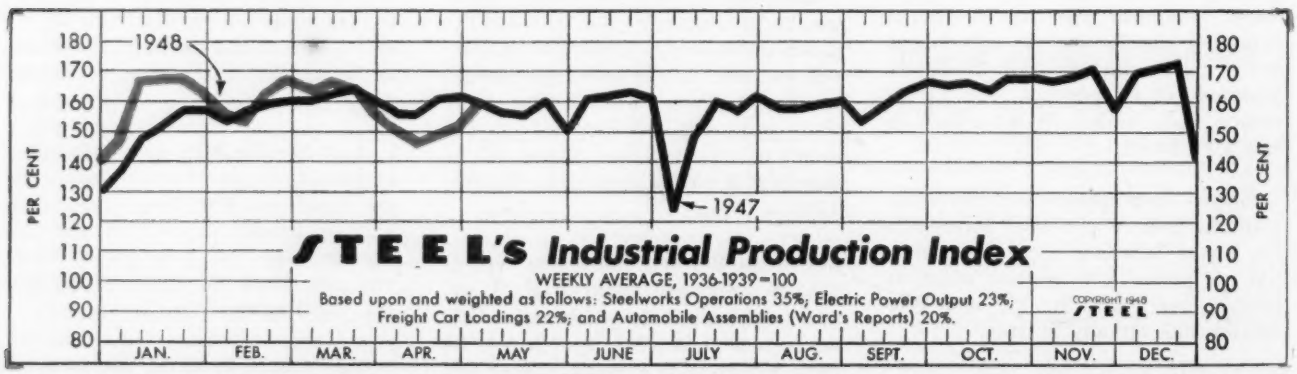
COAL—Bituminous coal output, continuing recovery in the week ended Apr. 24, reached an estimated 11,350,000 net tons. In the preceding week it was only 7,715,000 tons.

CAR LOADINGS—Resumption of coal mining is reflected in a number of ways in figures on railroad freight car loadings, which in the week ended Apr. 24 rose to 852,309 cars, highest since the week ended Dec. 6. While the greatest increase stemmed from loadings of coal, other loadings dependent on uninterrupted coal mining and transportation also gained.

ELECTRICITY—After declining in the week ended Apr. 24 to a new low for the year, 5,027,280,000 kilowatt hours, approximately 400 million kwh below the year's high in the week ended Jan. 24, thereby marking the sharpest drop since records have been kept, electricity production in the week ended May 1 totaled 5,042,352,000 kwh. The 400 million kwh drop is twice the amount ordinarily recorded at this time of year. Utility industry representatives point out the drop took place despite resumption of coal mining, and attribute it to a decline in electricity consumption by small industrial plants, which possibly were just beginning to feel the impact of the mining stoppage. Inception of daylight savings time had not begun to reduce electricity use.

PRICES—Although there were slight declines in four major commodity groups, average primary market prices continued to rise for the third consecutive week, putting the Bureau of Labor Statistics wholesale price index for the week ended Apr. 24 to 163.6 per cent of the 1926 average, compared with 162.9 in the preceding week. Reflecting effects of the commodity market break earlier in the year, the U. S. Department of Labor consumers' price index (cost of living) receded in March to 166.9 per cent of the 1935-1939 average. In February it was 167.5.

ORDER BACKLOGS—Reversing the February and March trend, order backlogs in April showed a tendency to increase, says the National Association of Purchasing Agents which attributes the change to a move on the part of buyers to rebuild inventories that had fallen below reasonable operating requirements as a result of an additionally cautious commitment policy after the February commodity market break.



Index (chart above): Week ended May 1 (preliminary) 159 Previous Week 153 Month Ago 154 Year Ago 159

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	87.0	75.5	88.5	94.0
Electric Power Distributed (million kilowatt hours)	5,042	5,027	5,037	4,640
Bituminous Coal Production (daily av.—1000 tons)	1,892	1,286	353	2,137
Petroleum Production (daily av.—1000 bbl.)	5,413	5,415	5,389	4,951
Construction Volume (ENR—Unit $1,000,000)	$183.2	$136.7	$218.8	$102.5
Automobile and Truck Output (Ward's—number units)	102,039	107,093	105,132	101,690

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

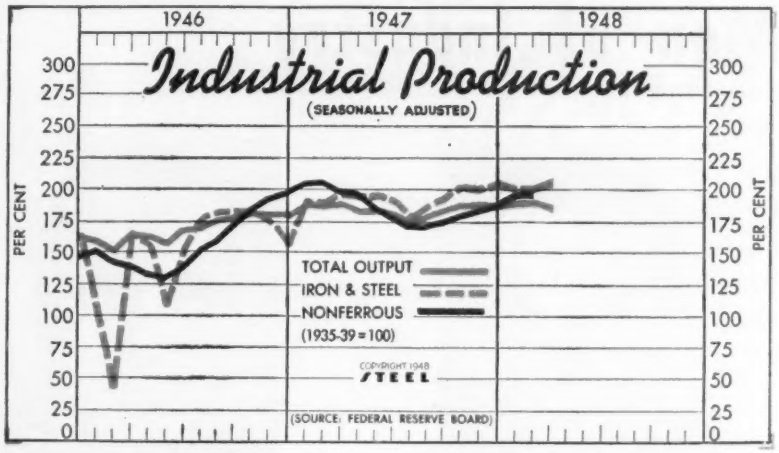
TRADE				
Freight Carloadings (unit—1000 cars)	855†	852	662	883
Business Failures (Dun & Bradstreet, number)	106	100	91	70
Money in Circulation (in millions of dollars)‡	$27,682	$27,718	$27,780	$28,118
Department Store Sales (change from like wk. a yr. ago.)‡	+11%	+8%	+17%	+15%

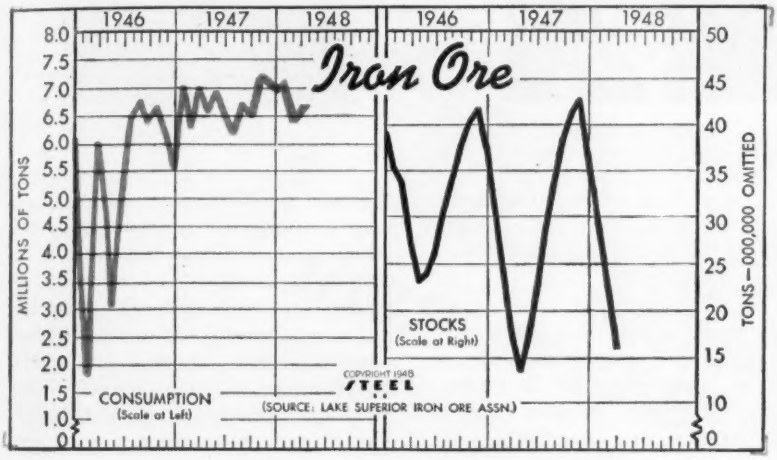
† Preliminary. ‡ Federal Reserve Board.

Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1948	1947	1948	1947	1948	1947
Jan.	193	189	203	192	197	203
Feb.	194	189	203	191	197	208
Mar.	192	190	209	196	...	202
Apr.	...	186	...	195	...	197
May	...	185	...	197	...	187
June	...	184	...	193	...	179
July	...	177	...	181	...	172
Aug.	...	182	...	188	...	171
Sept.	...	186	...	195	...	174
Oct.	...	190	...	204	...	179
Nov.	...	192	...	202	...	185
Dec.	...	192	...	205	...	189
Ave.	...	187	...	195	...	186





Iron Ore

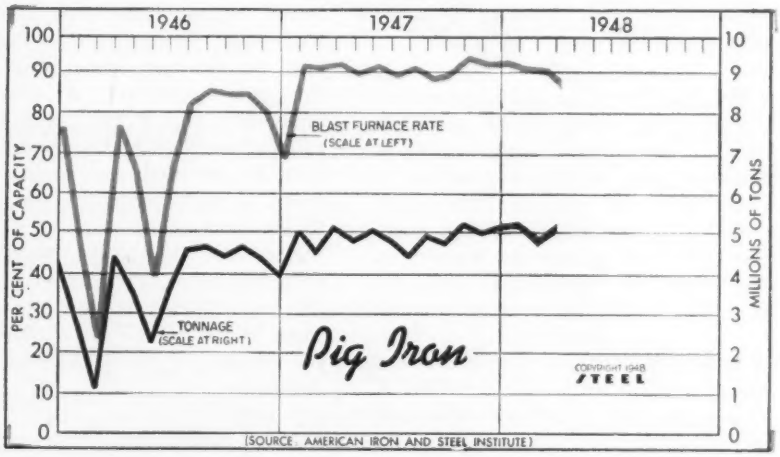
(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1948	1947	1948	1947
Jan.	7,057	7,024	29,081	30,514
Feb.	6,440	6,264	22,628	24,317
Mar.	6,634	6,979	16,022	17,411
Apr.	....	6,579	.....	13,555
May	....	6,885	.....	17,618
June	....	6,500	.....	21,746
July	....	6,156	.....	28,440
Aug.	....	6,638	.....	33,896
Sept.	....	6,492	.....	38,370
Oct.	....	7,151	.....	41,641
Nov.	....	7,068	.....	43,010
Dec.	....	6,970	.....	36,095
Total	....	80,807		

Pig Iron*

	Production (Net Tons—000)			Operating Rate (% of capacity)		
	1948	1947	1946	1948	1947	1946
Jan.	5,194	5,071	2,644	90.9	90.8	47.4
Feb.	4,838	4,550	1,148	90.6	90.3	22.2
Mar.	5,020	5,123	4,424	87.8	91.8	77.3
Apr.	....	4,830	3,614	...	89.3	65.2
May	....	5,081	2,274	...	91.0	39.8
June	....	4,810	3,682	...	89.0	66.5
July	....	4,585	4,705	...	90.3	82.4
Aug.	....	4,916	4,898	...	88.1	85.6
Sept.	....	4,801	4,687	...	89.0	84.8
Oct.	....	5,228	4,814	...	93.6	84.1
Nov.	....	5,015	4,435	...	92.8	80.0
Dec.	....	5,177	3,992	...	92.9	69.9
Total	....	59,210	45,318	Ave...	90.1	67.4

* Includes ferromanganese and spiegeleisen.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,865	$14,245	$12,925	$11,275
Federal Gross Debt (billions)	$252.2	$252.3	$253.1	$257.9
Bond Volume, NYSE (millions)	$22.6	$33.8	$22.6	$18.8
Stocks Sales, NYSE (thousands)	7,639	10,545	6,651	4,329
Loans and Investments (billions)†	$63.5	$62.9	$63.2	$63.4
United States Gov't. Obligations Held (millions)†	$35,643	$35,260	$35,469	$39,650

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$81.14	$81.14	$81.14	$69.82
All Commodities†	163.6	162.9	161.1	146.8
Industrial Raw Materials†	177.8	178.0	175.9	161.3
Manufactured Products†	158.9	157.8	155.9	141.1

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

LESTER M. CURTISS

HARRY BERNARD

JOSEPH N. WHITE

Lester M. Curtiss, who has been general manager, steel plants, Lukens Steel Co., Coatesville, Pa., has been named general works manager of the company and its divisions, By-Products Steel Co. and Lukenweld. He has been associated with the company since 1919. He is succeeded in his position as manager of steel plants by **L. P. McAllister,** who has been assistant in that position since April, 1947, and connected with the company since 1922.

—o—

Edmund Hoffman has been elected secretary and treasurer of American Can Co., New York, to succeed **R. A. Burger,** who has retired after 47 years with the company. Mr. Hoffman has been manager of the industrial relations department since 1944. He joined the company in 1901, the year of its formation.

—o—

Standard Forgings Corp., Chicago, announces appointment of **Arthur F. Reum** as vice president—sales department. He formerly had been assistant vice president.

—o—

James T. O'Connor has been appointed manager of sales at Cleveland district office, Carnegie-Illinois Steel Corp. He succeeds **William S. Saylor,** appointed manager of sales in Detroit, who in turn succeeds **F. C. Hardie,** assigned other duties with the company in Pittsburgh.

—o—

C. W. Coslow, vice president-manufacturing, Los Angeles plant, and **M. M. Mautner,** vice president and secretary, have been elected directors of Plomb Tool Co., Los Angeles.

—o—

H. V. Huleguard has resigned as vice president and general manager of Whitcomb Locomotive Co., a subsidiary of Baldwin Locomotive Works, Eddystone, Pa.

—o—

Harry Bernard has been appointed chief engineer, Mack Trucks Inc., New York, succeeding **W. M. Walworth,** resigned. Mr. Bernard joined Mack in 1924. In 1942, owing to the pressure of wartime truck and diesel engine manufacture and the consequent curtailment of bus output, he was appointed assistant to the vice president in charge of production, and a year later became general service manager, in which post he directed the supply of all Mack service parts to the United States and allied armies until the end of the war. **John Walker** has been appointed off-highway and mining truck sales manager. For the last three years he has been manager of the company's sales engineering department.

—o—

E. S. Ronk, sales manager, Bowser Inc., Refrigeration Division, Terryville, Conn., has been named general manager. He succeeds **M. J. Kennedy,** who accepted a position with Renfrew Electric Co., Renfrew, Ont., Canada. Mr. Ronk, who entered the employ of Bowser Inc. in 1943, became sales manager in 1945, which position he will continue to occupy temporarily in addition to his new duties as general manager.

—o—

Lawrence F. Black has been appointed assistant chief engineer, American Steel & Wire Co., Cleveland, U. S. Steel Corp. subsidiary. **Charles B. Hull** has been named assistant division engineer of construction. Mr. Black first joined the company in 1924, serving in various positions before being transferred in 1943 to Duluth, where in 1945 be became superintendent of engineering and maintenance, and which he now leaves to assume his new duties. Mr. Hull has been with the company since 1925, and progressed to chief draftsman in the engineering department, Cleveland.

—o—

Joseph N. White has been elected comptroller of Pittsburgh Steel Co., Pittsburgh. He joined the company in 1922 and progressed through the various divisions of the accounting department of the company. In 1936 he was made auditor and held that position until 1944, at which time he was elected assistant comptroller. He succeeds **J. Herbert Carson** as comptroller. Mr. Carson has resigned to become treasurer of Leslie Salt Co., at San Francisco. **G. Herbert Keisling** has been elected to succeed Mr. White as assistant comptroller. **R. M. Hillman** has been elected assistant treasurer of the company.

—o—

E. R. Klassey has been named president, James Mfg. Co., Fort Atkinson, Wis. He succeeds the late **W. D. James,** founder of the company. Mr. Klassey has been associated with the firm for 28 years, and served successively in the capacity of company treasurer, director, secretary, and vice president. **C. A. Hanson,** general sales manager, has been named vice president and director; **H. A. Wagenknecht,** credit manager, has been promoted to secretary; and **H. A. Asmus** continues as treasurer.

—o—

James M. Underwood, president,

Another LATROBE first!

Designed for Intermediate Service

... where the full properties of the more costly higher alloy high speed steels are not required!

LATROBE DESEGATIZED BRAND OF DISPERSED-SEGREGATE HIGH SPEED STEELS

This new **ELECTRITE MV** family of high speed steels is the product of years of research by Latrobe Electric Steel Co. metallurgists. Developed specifically to fill the need for Intermediate Alloy High Speed Steels, the MV family is suitable for uses where higher alloys are not required.

The introduction of these new steels marks another step forward in Latrobe's continuing efforts to produce for Industry better steels for better tools at lower cost.

These intermediate high speed steels are recommended for small drills and reamers, thread chasers, taps, pipe taps, etc., wood-working knives and cutters and for body stock for carbide-tipped drills and reamers. Our sales engineers will be glad to assist you in selecting the proper grade for your particular applications.

LATROBE ELECTRIC STEEL CO., Latrobe, Pa.

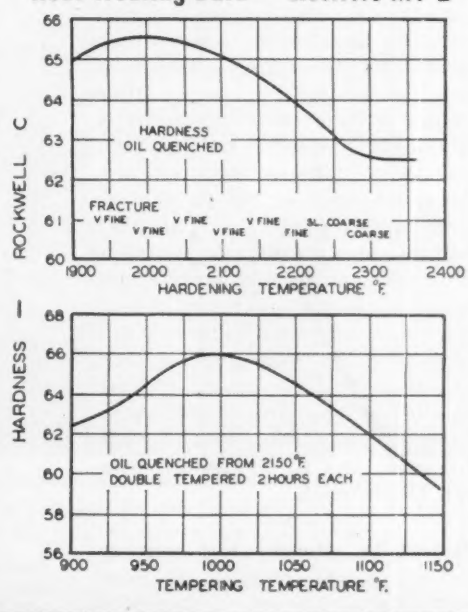
4

TYPICAL ANALYSES

		C	Cr	Mo	Va
MV-1	43¢ base	.80	4.10	4.25	1.10
MV-2	48¢ base	.88	4.10	4.25	2.00
MV-3	58¢ base	1.18	4.10	4.25	3.15
MV-4	68¢ base	1.40	4.10	4.25	4.15

Shown at right are hardening and tempering curves of MV-2 grade.

Heat Treating Data — Electrite MV-2



Vulcan Mold & Iron Co., Latrobe, Pa., has been elected a director of Latrobe Electric Steel Co., Latrobe, Pa., to succeed the late **A. M. Morgan.**

—o—

Lawrence M. Muse has been appointed assistant to the general manager, Industrial Division, Sherwin-Williams Co., Cleveland.

—o—

Billings & Spencer Co., Hartford, Conn., manufacturer of drop forged wrenches, shop tools and drop forged parts for industrial and commercial use, announces the appointment of **Worden W. Gentino** as its representative in the Chicago territory, with headquarters at Chicago.

—o—

William B. Hubbard, president, Cherry Rivet Co., Los Angeles, has been named to the board of the California Manufacturers Association.

—o—

Sam S. Spektor, former plant manager, U. S. Gas Range Corp., New York, announces opening of his own consultant engineering offices at 111 Broadway, New York.

—o—

Fred M. Gunn and **R. W. Higgins** have retired from Pullman-Standard Car Mfg. Co., Chicago. They both started with the company in 1892 at the Chicago Car works. Mr. Gunn has been assistant to the president of the company, and Mr. Higgins, accounting consultant.

—o—

Keith F. Gallimore, vice president in charge of engineering, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., has been elected to the board of directors, to succeed the late **Hans B. Kraut.**

—o—

Howard H. Weber has been appointed chief engineer of the wire and cable department, United States Rubber Co., New York, and **A. S. Basil,** general sales manager. Other changes in the department are: **H. J. MacDonald,** assistant to the manager; **H. F. Johnson,** assistant general sales manager; **R. A. Walker,** merchandise manager; **J. A. Leuver,** assistant sales manager in charge of distribution; **D. B. Karlskind,** assistant sales manager in charge of commodities, sales engineering and new projects; **G. E. Hubrig,** sales manager, Western Division; **C. A. Bartron,** chief sales engineer; **A. E. Aune,** manager, automotive and aircraft wire sales, and **R. C. Cassidy,** manager, Uskon sales.

—o—

Robert W. Murphy has been appointed general counsel of Borg-Warner Corp., Chicago, to succeed **G. A. Shallberg** in that position. Mr. Shallberg continues as executive vice president of the corporation.

—o—

Dow Corning Corp., Midland, Mich., has announced opening of a new office in Atlanta to service the southern part of the country. **R. B. Ehlers** has been placed in charge of this branch office. Assisting Mr. Ehlers will be **R. E. Knopf** in general sales, **H. E. Gorman Jr.,** in consumer products, and **George Lohstroh,** bakery service representative for the corporation.

—o—

Western Electric Co., New York, announces appointment of **Arthur B. Goetze,** personnel director, to the post of acting works manager of the company's Tonawanda, N. Y., plant, its 42nd Street Shops in New York, and Electronics Shops in Allentown, Pa. **Joseph R. Bransford,** assistant personnel director, has been appointed to succeed Mr. Goetze.

—o—

Harold P. Wolf has been appointed assistant manager of commercial research department of Rheem Mfg. Co., San Francisco.

—o—

Herbert C. Holtz, vice president and works manager, and **Le Roy A. Strube,** assistant works manager, Hennecke Co., Milwaukee, have resigned their positions with this structural steel fabricating company. They have been associated with the firm 26 and 12 years, respectively.

—o—

International Business Machines Corp., New York, announces appointment of **Marion R. Dilling** as assistant IBM manager of customer engineering, with headquarters at New York. He previously was manager of all company sales and services in Helena, Mont.

—o—

William D. Carter has been appointed superintendent of Seaboard Mills at Burlington, N. C., United States Rubber Co.'s Textile Division.

—o—

Irving B. Babcock has resigned as president of Avco Mfg. Co., Cincinnati, due to ill health. **Victor Emanuel,** chairman of the board, will assume these duties.

—o—

Karl M. Kreiner, general sales manager, Packard Motor Car Co., Detroit, has been appointed a vice president of the company.

—o—

Otis Radford has been appointed controller of the Tucker Corp., Chicago, in addition to his position as treasurer of the company.

—o—

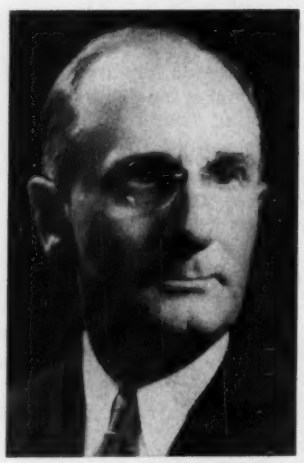
A. L. Adams, formerly manager, export aeronautical sales in England and Europe, Goodyear Tire & Rubber Co., Akron, has been appointed sales engineer for the Aviation Products Division on the West Coast.

—o—

Firth Sterling Steel & Carbide Corp., McKeesport, Pa., announces the appointment of **A. B. Vestal** to its management's staff. During the past eight years, he served as head of industrial engineering of both the Farrell and Duquesne plants of Carnegie-Illinois Steel Corp., and more recently served on its company staff.

—o—

D. W. R. Morgan and **John K. Hodnette** have been elected vice presidents of Westinghouse Electric Corp., Pittsburgh. Mr. Morgan will continue to direct operations at the South Philadelphia Works, which includes the Steam Division and the Aviation Gas



W. W. SEBALD

Elected president, Armco Steel Corp., Middletown, O., formerly known as American Rolling Mill Co. Noted in STEEL, May 3 issue, p. 82

HENRY J. MORTON

President of the recently formed Morton-Gregory Corp. of Michigan. Noted in STEEL, May 3 issue, p. 82

New Bliss Presses for Nash Bodies

Bliss presses are rugged production equipment, easy to install, adjust and repair. That's why they're favored at Nash's Milwaukee body plant, as they have been ever since Nash first started building cars...why they predominate on practically every one of its stamping set-ups.

The majority of the presses in the Nash Body Plant *are Bliss-Built*. They range from a three-ton capacity bench press for riveting small sections to a battery of 500-ton fully enclosed presses recently installed for the production of side quarter panels.

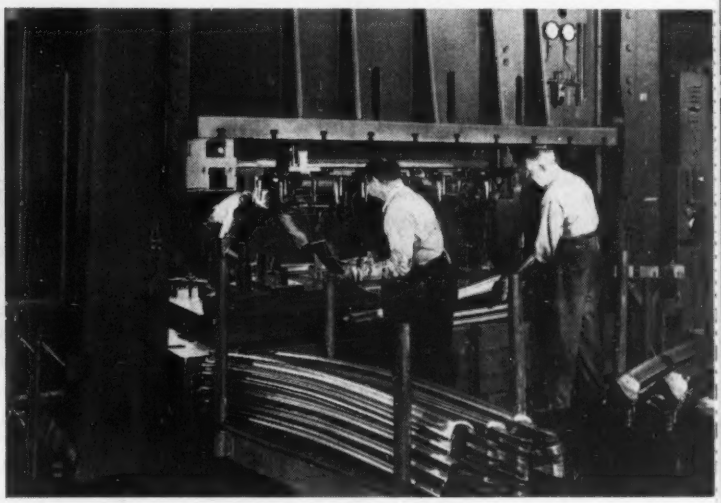
You'll find similar case histories wherever you look in the automotive industry—in fact, *every* industry that depends upon pressed-metal production. That's because Bliss builds and delivers more than a press. It provides a fund of engineering knowledge, going back 90 years, for its maximum production. That's why Bliss on your press is more than a name—it's a guarantee! Let a Bliss sales engineer help you get the most out of your presses. Send for him today.

E. W. BLISS COMPANY, DETROIT 2, MICHIGAN

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

WORKS AT: Toledo, Cleveland, Salem, Ohio; Hastings, Mich.; Englewood, N. J.; Derby, England; St. Ouen sur Seine, France • SALES OFFICES AT: Detroit, Hastings, Mich.; New York, Rochester, N. Y.; Cleveland, Dayton, Toledo, Salem, Ohio; Philadelphia, Pittsburgh, Pa.; Chicago, Ill; New Haven, Conn.; Windsor, Ont.

Side quarter panels for Nash cars undergo a series of forming and trimming operations in this battery of Bliss enclosed single action presses. The presses in the foreground are 124" between uprights and deliver 500 tons pressure at bottom of stroke.



The wide and deep bed of this 500-ton Bliss enclosed press is utilized to full advantage in production of Nash running board aprons. Double dies are used to pierce five holes in each of two aprons with each stroke.

MARQUETTE • BLISS • CONSOLIDATED
BLISS BUILT
TOLEDO

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES THAN ANY OTHER COMPANY IN THE WORLD

Turbine Division there, as well as the Stoker Division at Attica, N. Y. Mr. Hodnette will retain his post as manager of the company's Transformer Division. **E. V. Huggins** has been appointed secretary of the corporation. He has been in charge of the company's legal activities in New York, which he continues to head.

—o—

Harry L. Showalter Jr., for a number of years prominent in the basic metalworking industry, has announced the forming of his own company. This firm, Girard Associates, was established last year, and is specializing in sales and engineering related primarily to the forge and press shop field. Its principal offices are in Philadelphia and Chambersburg, Pa.

—o—

Allen W. Lovell, general manager, has been elected vice president, Modern Collet & Machine Co., Ecorse, Mich. He joined this company as sales manager in 1944, and was appointed general manager in 1946.

—o—

John A. Slenker has been appointed general superintendent of the Duluth, Minn., Works of American Steel & Wire Co., U. S. Steel Corp. subsidiary. He succeeds the late **F. J. Martin.**

—o—

William H. Rex Jr. has been appointed industrial engineer for rayon manufacturing plants, Link-Belt Co., Chicago. He will have headquarters at Philadelphia plant.

—o—

Miles S. Wright has been appointed superintendent, and **Charles E. Stroud,** assistant superintendent of Pittsburgh Plate Glass Co.'s new Twindow plant at Creighton, Pa.

—o—

E. J. Kanker has been appointed manager of the Chicago branch for Bendix Appliances Inc., South Bend, Ind. He succeeds **A. L. McCarthy,** resigned.

—o—

Kensington Steel Co., Chicago, announces the appointment of **H. M. Albers** as assistant sales manager.

—o—

Boris M. Volynsky has been named manager of the New York office of Simmons Machine Tool Corp., Albany, N. Y. He was manager of the Simmons office from 1934 to 1939. During the war years he was president of Atlantic Machinery Corp., New York.

—o—

W. O. Mitchell has been appointed plant manager and engineer, Shiffler plant, American Bridge Co. at Pittsburgh. He succeeds **H. B. Hill,** who has retired after over 44 years of service with this subsidiary company of U. S. Steel Corp.

—o—

Wendell G. Fogg has been appointed executive engineer, Air Reduction Sales Co., New York, to assist the director in the planning, coordination and review of the activities of the research and engineering department.

—o—

Liquid Conditioning Corp., Linden, N. J., announces **E. Philip Kron** has joined its Buffalo, N. Y., representative, Brookman-Hazel Associates, as partner of that organization.

—o—

Joseph T. Sloane has been named advertising manager, TelAutograph Corp., New York. He had formerly been assistant advertising manager of Denver Chemical Mfg. Co., New York.

—o—

John J. Huether has been named manager, Transportation Division, a new industry sales division of the apparatus department, General Electric Co., Schenectady, N. Y.

—o—

Maynard B. Terry has been appointed general sales manager, American Brakeblok Division, American Brake Shoe Co., New York. Formerly manager of equipment sales, Mr. Terry has served in various sales capacities since joining the company in 1943.

—o—

Henry J. Hart has been appointed vice president in charge of production, Royal Typewriter Co. Inc., New York. He joined the company in 1917 as a tool designer. In 1945 he became factory superintendent and in March, 1948, factory manager.

—o—

R. W. Roush, who has served the Timken-Detroit Axle Co., Detroit, as chief metallurgist since 1935, has been appointed chief materials engineer. Before joining Timken-Detroit, Mr. Roush had been a metallurgist for 13 years at Cadillac Motor Car Co.

—o—

A. W. Ross, former body engineer for Plymouth Motor Corp., Detroit, has been promoted to assistant chief engineer. He joined Chrysler Corp. in 1934 as an engineer in the structures laboratory, continuing until the war, when he was transferred to the De Soto Warren plant as stress engineer, and later assistant chief engineer. He joined Plymouth in October, 1945, as body engineer.

—o—

Two directors added to the board of Pollak Steel Co., Cincinnati, are:

L. H. LITTLEFIELD

Appointed general sales manager, Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co. Inc., Detroit. Noted in STEEL, May 3 issue, p. 84

William R. Klinkicht, chief metallurgist and manager of sales of the Merchant Bar Division, and **Carl L. Volkman,** manager of construction materials.

—o—

M. F. Noble and **E. W. Gutgsell** have been appointed assistant sales managers of Fresh'nd-Aire Co., Chicago, a division of Cory Corp.

—o—

Robert LeFevre has been named to the Minneapolis district merchant trade sales staff, Ceco Steel Products Corp., Chicago, manufacturer of metal building materials of all kinds.

—o—

Carroll Stansbury has been appointed to the Electronics Division, National Bureau of Standards, where he will do research in the engineering electronics laboratory.

—o—

Sara E. Southall, assistant personnel manager, International Harvester Co., Chicago, and nationally known industrial relations authority, retired after 28 years of service. She joined the Harvester staff to develop policies on employment of women.

—o—

Waterbury Mfg. Co., division of Chase Brass & Copper Co., at Waterbury, Conn., announces promotion of four employees as follows: **Robert A. McNeily,** assistant plant manager; **Ralph R. Brandely,** supervisor of estimating department; **George E. Bolan,** supervisor of cost department; and **Joseph J. Dubiel,** who will be in charge of the assembling, inspecting, packing and shipping of plumbing fixtures.

—o—

W. F. Detwiler, chairman of the board of directors of Allegheny Ludlum Steel Corp., Pittsburgh, for the past 10 years, has been named hon-

CHARLES R. D'OLIVE

Vice president and general manager, Ingersoll Utility Unit Division, Borg-Warner Corp. Noted in STEEL, May 3 issue, p. 87

ROY F. CRATTY

Has joined Industrial Advertising Division, Cramer-Krasselt Co., Milwaukee. Noted in STEEL, May 3 issue, p. 87

W. R. HOUGH

Elected engineering vice president, Reliance Electric & Engineering Co., Cleveland. Noted in STEEL, April 26 issue, p. 92

orary chairman. **Lester H. Bittner,** director of purchases, has been elected to the newly created position of vice president in charge of purchases.

—o—

Joseph A. Burgard has been appointed technical sales representative for the general sales department of Columbia Steel Co., at San Francisco. He will assist division sales organizations in developing markets for stainless, alloy and high-strength steels.

—o—

Edward E. Pfister, service manager at the Cleveland office of Carnegie-Illinois Steel Corp., U. S. Steel Corp. subsidiary, has reached the corporation's retirement age and has been succeeded by **Paul W. Knox,** who has been assistant chief clerk at the Cleveland office. Mr. Pfister, who became associated with Carnegie in 1913, has always been located in the Cleveland office. He now is engaged in purchasing for Bellevue Mfg. Co., Bellevue, O., and is located at that company's Cleveland office.

—o—

Norman Olsen, sales manager of Aluminum Seal Co., subsidiary, Aluminum Co. of America, has been named vice president in charge of sales for the company.

—o—

Fort Pitt Bridge Works, Pittsburgh, announces the following elections: **R. F. Hartner,** treasurer and secretary; **T. A. Straub Jr.,** assistant to the president; **James M. Straub,** re-elected president; **John H. Sorg,** re-elected vice president and general counsel; **D. B. Straub,** re-elected secretary and assistant treasurer; and **R. K. Steffey,** re-elected controller.

—o—

J. A. Borden has been elected vice president in charge of the Scotch Tape Division of Minnesota Mining & Mfg. Co., St. Paul. **J. C. Duke** has been elected vice president in charge of the 3M Coated Abrasives Division.

—o—

Charles R. FonDersmith, superintendent, steel production, Armco Steel Corp., Middletown, O., has been elected chairman of the National Open Hearth Steel Committee, American Institute of Mining & Metallurgical Engineers. He succeeds **W. C. Kitto,** director of raw materials, Pittsburgh Steel Co., Monessen, Pa. **E. G. Hill,** past president of the Iron & Steel Division of AIME, and director of metallurgy and development of Wheeling Steel Corp., Wheeling, W. Va., has been elected vice president.

—o—

Joseph P. Wright, formerly treasurer, Western Foundry Co., Chicago, has been elected vice president in charge of sales, and **Frank D. O'Neil,** formerly assistant to the president, has been elected treasurer.

OBITUARIES . . .

Daniel W. Lathrop, 65, director and former vice president in charge of sales, Atlas Steels Ltd., Welland, Canada, died Apr. 21. He joined Atlas Crucible Steel Co., Dunkirk, N. Y., in 1911, serving as vice president from 1917 to 1922, when he began developing a tool steel industry in Canada, Canadian Atlas Crucible Steel Co., at Welland, a branch of the Dunkirk organization. In 1928 he joined Roy H. Davis in acquiring the company's Canadian interests to form Atlas Steels Ltd.

—o—

Ralph L. Riese, 55, district representative, Fort Pitt Bridge Works, Pittsburgh, died Apr. 27 at Massillon, O. Associated with the Works since 1930, Mr. Riese had been district representative of the Columbus, O., territory for the past four years.

—o—

John Hiltbrand, 65, president, Scranton Truck Body & Equipment Co., Cleveland, died recently.

—o—

George W. Lamountain, 57, superintendent of properties for the Aluminum Co. of Canada Ltd. since 1942, died in Montreal Apr. 19.

—o—

James P. Begley, 62, chief metallurgist and works manager, Pratt & Letchworth Co., Buffalo, N. Y., died Apr. 26 in that city.

—o—

James Craig, engineer for W. W. Bliss Co. at Cleveland since 1930, died May 4. He was formerly president of National Iron & Wire Co., Cleveland, which was liquidated in 1930 after many years of operation.

—o—

David P. Davies, 77, vice president and consulting engineer, J. I. Case Co., Racine, Wis., died Apr. 25.

—o—

Edward A. Sumner, 73, former member of the board, American Radiator Co., New York, died recently.

—o—

James C. Willson, 62, retired aviation financier, and a member of the executive committee, Curtiss-Wright Corp., New York, died recently after a long illness.

—o—

Perry N. Ellis, 60, vice president, Avondale Marine Ways Inc., Westwego, La., died recently.

40-Ton Earth Movers Roll On WELDED WHEELS

by AMERICAN WELDING

● Massive 1,000-pound wheels are but one of many applications of American Welding's "Controlled Technique" in the manufacture of highly specialized weldments. The fabrication of wheels by welding makes it possible to design for specific loads at minimum cost.

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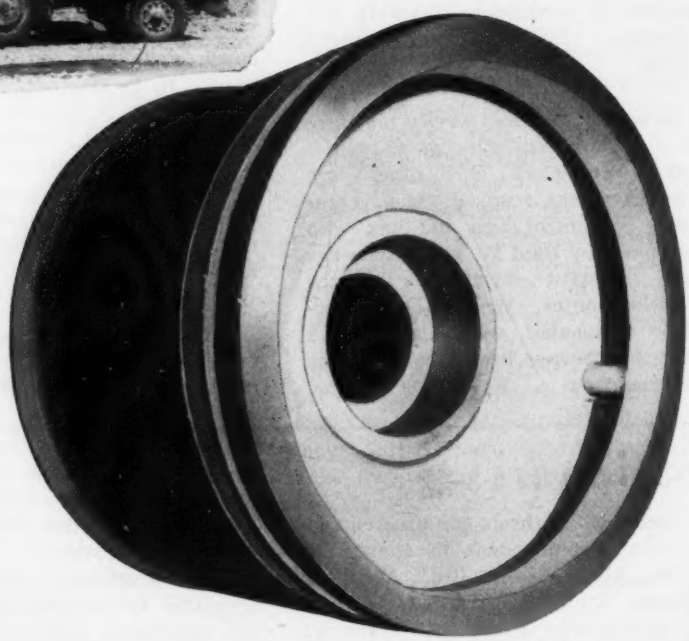

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THE AMERICAN WELDING AND MANUFACTURING COMPANY

110 DIETZ ROAD • WARREN, OHIO

Engineering News . . . AT A GLANCE

CASTS HEAVY CRANKSHAFTS— Out on the West Coast, the Renton plant of Pacific Car & Foundry Co., is casting in nickel molybdenum-alloy iron crankshafts ranging in weight from 800 to 4000 pounds, and in length from 6 to 18 feet. Adequate tensile strength is developed by proper alloying and by ladle inoculation. Stress is relieved by a heat treating process similar to tempering. Because of the metallic composition, each shaft is said to provide superior lubrication properties and longer life.

TO HELP OVERCOME FUEL SHORTAGES— Cold carbureting process using pentane, by-product of gasoline, developed by Safe-Tee-Way Inc., Cleveland, looms as an additional "weapon" for industry in the fight against gas shortages. Process is used in connection with an electrically-operated machine that produces gas from the liquid fuel. Gas is generated by forcing air at controlled rate of flow through a fixed amount of fuel which is automatically transferred from the storage tank to the producer unit. Although the unit is being marketed for domestic use, several plants already are, and contemplate using the unit in "gang" fashion for standby use. Installations require no flues inasmuch as the fuel is nonasphyxiating, nonpoisonous, nonexplosive and odorless.

IMPROVES END-PRODUCT— Use of centrifugally cast slabs for rolling is the latest wrinkle in the production of aluminum bronze rolled sheet in the Milwaukee plant of Ampco Metal Inc. According to the company, the centrifugally cast material results in a sheet that is sound, solid, flaw-free and uniform. The company furnishes the sheet annealed for fabrication purposes, where corrosion resistance is important or, unannealed and specially processed, for applications where wear resistance is essential, such as gibs, ways, liners and similar parts in metalworking equipment.

HIGH VOLTAGE "RETARDER"— Perfection of methods for making sulphur hexafluoride—a gaseous insulator capable of holding the highest voltages now generated—was revealed recently by Pennsylvania Salt Mfg. Co.'s Whitemarsh Research Laboratories, Philadelphia. Termed as one of the most promising of fluorine research developments, the gas is extremely inert—much more stable than air (five times as heavy) and even more inert than nitrogen gas. Its most notable use to date was at M. I. T. to insulate the Van de Graaf electrostatic high-voltage generator which produces millions of volts used in nuclear physics studies. Experiments indicate that the insulating factor of the gas is such that the capacity of similar generators can be doubled and even reduced in size with safety. Besides applications for x-ray machines etc., company scientists also are examining possibilities of the gas as a fire extinguisher and as a refrigerant.

MANIPULATES VIA REMOTE CONTROL— Operation of machine tools and countless other tasks can be performed in dangerous radioactive areas by mechanical "hands", it was demonstrated by General Electric during the 18th annual Safety Exposition, Hotel Pennsylvania, New York. In actual use the "hands" would extend over a protective 8-foot wall into a radioactive area but would be operated by remote control from an adjacent room. From behind the same wall, the "hands" also can be changed to fit the task. A large one, for example, can be used for heavy jobs or, if the task requires a more delicate touch, it can be lowered into a holder and a smaller hand substituted. One hand also can be provided with a pair of snips for cutting sheet metal.

IDEAL GAS — In heat processing of metals, many applications are concerned with protective atmospheres. For ferrous alloys, use of a carrier gas to which additions may be made as desired is the commonly accepted practice. While an ideal carrier gas should be nonexplosive when mixed with air at low temperatures, it should simultaneously be capable of a ready check to determine its capacity for decarburization. Such a gas, it is revealed, should contain at least 20 per cent carbon monoxide—it should be satisfactory up to 30 per cent. Balance should be nitrogen. Carbon dioxide content must be held to a trace, and hydrogen eliminated because of its explosiveness. (p. 90).

"TUNED" TO DEMANDS — Procedures followed in processing components in fabricating alternating-current welding units at the new Westinghouse Buffalo plant provide flexibility for continuous production-line expansion to meet expected demands. Manufacturing operations of all types, shearing, bending, drilling, stamping and joining, for example, are spotted to make effective use of the various materials moving devices which are strategically selected to handle increased output. (p. 96).

UNTAPPED CONVEYOR MARKET — In sampling major metalworking industry groups to determine if product manufactured affected the extent of conveyor usage, STEEL found heaviest users were plants such as steel and auto assembly groups depending on highly mechanized operations. These organizations stood high in the compilation in relation to such concerns as instrument makers where considerable high precision work is required. (p. 104).

AIDS RESEARCH ACTIVITIES— Flexible arrangement for setting up experimental flow sheets to concentrate iron ore is a special feature of the new research laboratory, established in Duluth by Oliver Iron Mining Co. Set up to extract iron from taconite and other ores, the lab includes a pilot plant area which is surrounded by bracketed steel uprights that, in combination with steel cross members and subway grating, permit installation of test equipment at various levels. Construction, much like a toy construction set, enables flow lines to be altered at will. (p. 108).

Furnaces and F

FOR HEAT PROCESSING METALS

Controlling factors involved in attacking heating problems and in determining atmosphere applications and surface effects are analyzed here with an eye to improving equipment

By FLOYD E. HARRIS
Furnace Engineer
Buick Motor Division
Flint, Mich.

REQUIREMENTS for heat application in the processing of metals are quite varied. At times it seems that every part thus processed presents a different heating problem. One may well investigate, then, the viewpoint from which the needs in furnace improvements and fuel utilization may be readily analyzed.

In connection with heating steel, two primary divisions may be followed: 1. Heating rates or problems in heat application, 2. surface effects, or problems other than heating.

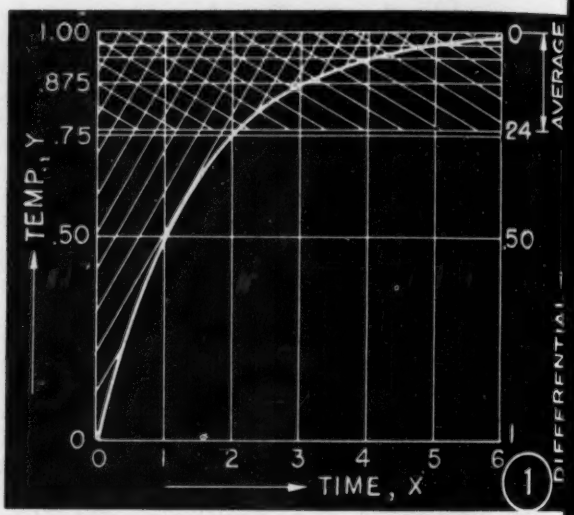
Heating Problems—As a basis for discussion, a theoretical curve for differential heating will be employed. This general plot will assume that the heating rate is directly proportional to the differential temperature; that is, to the difference in temperature between the source or head temperature and the temperature of the piece. This idealized curve has the advantage of being readily analyzed. All of its properties are known, and the plot may be easily constructed.

This theoretical curve is based on the following assumptions:

1. Limiting factor is the transfer of heat to the furnace, and not the conduction of heat to the interior. 2. Coefficient of heat transfer does not vary with temperature. 3. Specific heat of the material being heated is constant and independent of temperature, and no phase changes (critical points for example) are found in the temperature range employed.

For the majority of the problems found in the heating of steel parts, the transfer of heat to the steel surface is the controlling factor. However the coefficient of transfer varies greatly with temperature when the transfer is by radiation. Also the specific heat of steel is by no means constant as the temperature varies. Nevertheless, these variations from the theoretical may be analyzed in conjunction with the curve, and used for purpose of demonstrating heating rates; zoning, couple location and heat application principles.

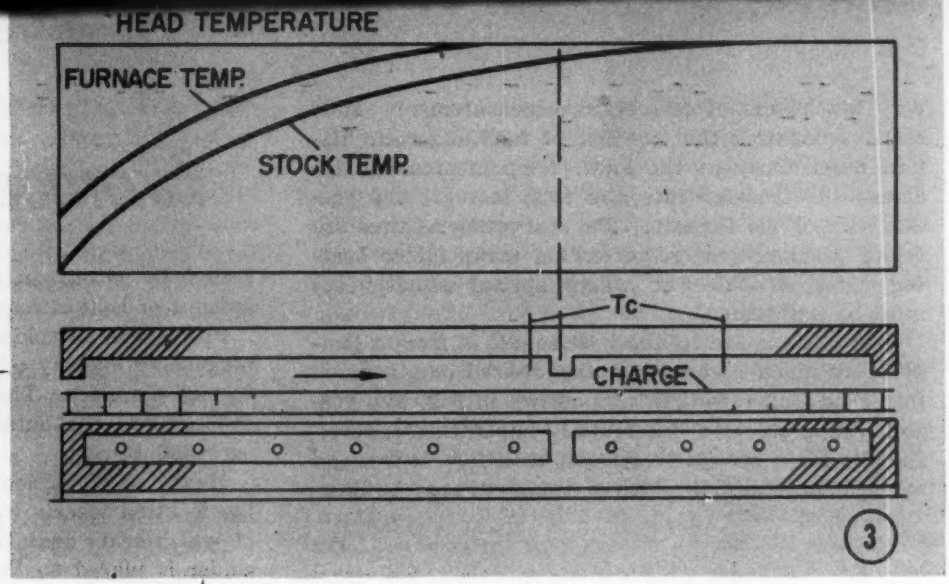
Graph shown in Fig. 1 is the common half-life



curve. The abscissa scale, X, is divided into six equal time divisions by the vertical ordinates. The curve is constructed so that the differential at the end of each time period is one-half that found at the beginning of the time period. The area (crosshatched) between the Y axis, the line Y = 1 (or line of zero differential); the curve itself represents the total heat to be added at the beginning of the heating operation. Similarly the area to the right of any vertical ordinate or time division represents the heat to be added to complete the heating operation. Also a line drawn horizontally through the differential scale (at right) will show the average heating rate for the complete time cycle. This area, crosshatched to left equals the total area representing heat input.

An interpretation may be made, concerning an application of furnace heating where the transfer is chiefly by radiation. We may begin by determining the minimum time to reach given head temperatures, with standard test pieces, originally at room temperature. Test conditions are carefully chosen; the furnace is evenly heated to the head temperature before the test piece is inserted, and the test piece is so small compared to the furnace capacity that the thermal equilibrium of the furnace is not disturbed.

This is a condition of low heat input to the charge. Under these conditions we find that the curve of Fig.



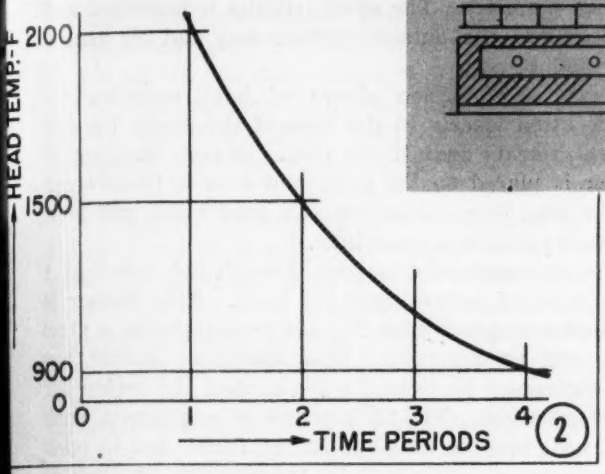


Fig. 1—Theoretical curve for differential heating

Fig. 2—Transfer by radiation to steel pieces of uniform section, showing effect of head temperatures on time of heating

Fig. 3—Continuous furnace, illustrating zoning and couple location

1 is obtained for all practical purposes for a wide range of head temperatures. Since the transfer rate for radiation increases rapidly with temperature, the time period decreases as the head temperature employed increases, although the higher the head temperature the greater the supply of heat required to bring the test sample to the furnace temperature. Beginning with 900°F as an arbitrary standard of time, it is found that at 1500°F only one half the time period is required. Again at 2150°F, the time period to temperature is but one half that found for 1500°F. These relative times to heat from 70°F to various head temperatures are shown in graphical form, Fig. 2.

An analogy may be made between the batch and the continuous furnace, by comparing time periods of the batch type with zones in the continuous unit. The entire analysis depends upon the heat transfer possible in a uniformly loaded, evenly heated furnace when the wall temperatures of the furnace exceed at no point the desired temperature. It is found that the curve, Fig. 2, may be used in this analysis and that the heating capacity per unit of hearth is inversely proportioned to the time periods as plotted. This capacity, to be a maximum, is based on the choice of at least two time periods for the batch furnace and two zones for the continuous unit.

Time periods, or zones, are periods of constant heat application. The heating period, following the charge of cold steel, is one of high heat input; the temperature attainment period is one of low heat input, approximately 20 per cent of the rate for the heating period. With reference to the heating curve, the heating period is one where the wall temperatures are continually increasing in temperature; the temperature attainment period is one where the walls are at the chosen head temperature.

Taking the heat input as 84 per cent for the heating period and 16 per cent for the temperature attainment period, it will be seen, Fig. 1, that the two time periods (or zones) are approximately equal. Practical considerations of heat applications will in general call for a slightly different proportion, for example 60 per cent for the heating period. For the continuous furnace, a zoning sketch and approximate heating curve are given for a 60-40 division.

This sketch shows the thermocouple location for the zones. The couple for the heating zone is located at the end of the zone in the direction of stock movement, as this is the point of highest wall temperature. Couple for the final zone is located in the center of length, since this zone is of uniform temperature for its entire length. Both couples are controlled at the desired head temperature.

It remains to define the term, hearth area, and to give the capacity loading under which controlled heating may be maintained. Hearth area will be taken as width of the hearth which is uniformly covered by the charge by the total length. Spacing is allowed along the furnace length, but the hearth should be half-covered to obtain this capacity. Rating in pounds per square foot of hearth area per hour ranges from 20 at 900°F to 80 at 2150°F; graph is shown in Fig. 6.

For a great many heating applications, reasonable care in heat application, and factors of zoning and loading will assure a uniform product, with no possible chance of overheating on thin sections and using

very few points of temperature measurement. It is easily recognized that the use of fans and recirculation particularly at the lower temperatures will increase the transfer rate and thus increase the productivity of the furnace. The real problems thus are found when process requirements make faster heating rates advisable or where special atmospheres must be maintained.

It is obvious that if the heat source is from a temperature much higher than the desired one, a much faster heating rate than that shown in Fig. 6 is possible. The use of a differential temperature generally calls for a special treatment, both for control and for heat application. Such a treatment may be illustrated by citing an operation where only a small amount of heat is required in quite a remote location.

Problem is to solder a plug in a bored shaft, this plug being midway of the bore which is slightly over ⅝-inch diameter. The shaft initially is hardened and ground, and the outside surface may not be heated over 300°F.

Next, a protection sleeve of heat resisting alloy is fitted loosely in the bore of the shaft, the top of which seats against the plug. In turn the ring of solder is placed on the plug, and heat is transferred to the plug from the sleeve at a rate which will melt the solder ring in a short time.

A very small pilot burner is employed, rated at 1 cubic foot of natural gas per hour. This burner is built in two parts with threaded connections, a steel body and an alloy tip. This miniature burner has the customary by-passed ports around the orifice for flame retention. The tip however is lengthened, such that heat may be supplied to the flame, and in open air will be maintained at a temperature of 1000°F. In this manner a very stable, short flame may be established. On lighting, the protective sleeve is placed directly over the burner tip, and the top part of the sleeve, over which the shaft assembly is to be placed, is held at approximately 1500°F. Products of combustion are forced downward, between the sleeve and the burner tip, and leave without coming in contact with the hardened shaft.

Complete operation of soldering the plug takes 1 minute and is accurately timed by removing the shaft from the tip assembly. The outside of the hardened shaft is barely 200°F after the heating operation. Success of such an operation depends entirely on close control of the mixture furnished the small burner. The extremely small amounts of gas and air would be hard to maintain in the correct ratio. However, connected to the manifold is a 6 cubic foot per hour tip, which is attached by a hose connection, and

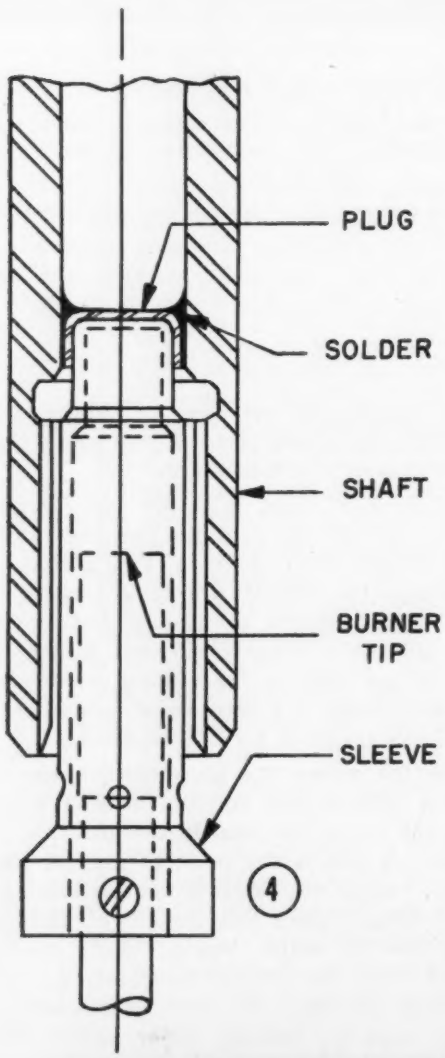
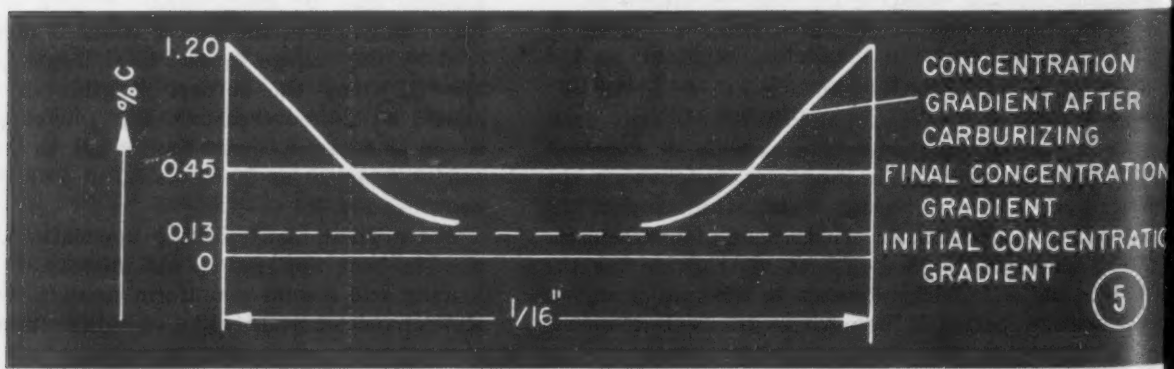


Fig. 4—Soldered plug assembly

Fig. 5—Concentration-depth diagram for processing spring

Fig. 6—Furnace ratings, various head temperatures



serves to light the small tip on starting. This auxiliary burner is carefully given the proper mixture for a sharp flame.

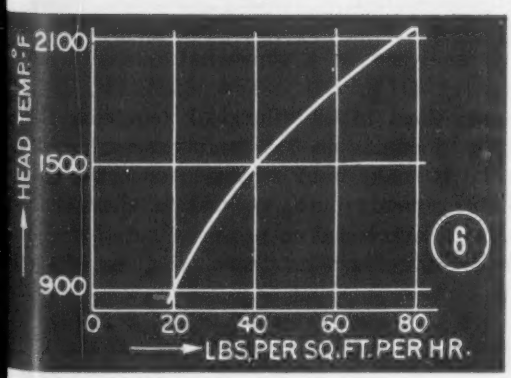
Once this is established, the mixture for the small tip, on the same manifold, must be the correct one, and the auxiliary flame applied to the tip makes lighting a simple operation. The assembly for the shaft, protecting sleeve and burner tip is illustrated in Fig. 4.

Many applications of differential heating are found in the high temperature field, particularly in hot forming and forging. At elevated temperatures, oxidation makes fast heating desirable, since holding for a long time increases the scale formation. Here as in the illustration given, each problem has its own peculiarities and care must be given to the processing.

It must be remembered that heat transfer, other things equal, is directly proportional to the area exposed for the part being heated. When high differentials are employed, irregular sections of the stock may cause uneven heating, although the heat source may be from a uniform (and high) temperature. Thus the end of rounds or squares and the edges of plates have much greater areas to which heat is transferred than do the interior sections. A glance at the plot of Fig. 6 will clearly show what may be done to decrease the time of heating operations and many forging practices depend on high differential temperatures.

Much remains to be done to make such practices safe and controllable. Extreme care in heat application, timing and temperature control are necessary for maintaining acceptable quality on many operations. This field offers an excellent opportunity for improved methods in gas utilization but much careful study is required in making such applications entirely successful from both economic and quality considerations.

Atmosphere Applications—A great number of applications are concerned with protective atmospheres. While a number of processes are accomplished by controlling the products of combustion in direct-fired furnaces, precise control of surface effects in general demands an atmosphere supply entirely separated from that generated by the heating source. While both heating and atmosphere problems deal with the control of chemical reactions, atmosphere demands are much more exacting from the gas supply standpoint than are the combustion requirements.



Since we are discussing the problems of the processor in the metals industry, it might be well at this point to emphasize the importance of a consistent gas supply as furnished by the utility. When the customer is interested in heating only, then a gas supply reasonably constant in Btu value will generally satisfy the operator although the composition of the gas may vary from day to day.

Reason for this of course is found in the properties of commercial fuel gases that the gas-air ratio for combustion is almost constant for a given Btu value. While the combustion characteristics may vary somewhat with composition, it is generally a simple matter to provide combustion facilities that will operate correctly as long as the available heat of the fuel gas does not vary greatly. When the same gas is used for preparing atmospheres, changes in compositions may often cause operating difficulties, as can readily be appreciated.

Without attempting to oversimplify the problems of atmosphere applications, their solution may be found in the control of gas composition and flow. For ferrous alloys, the use of a carrier gas to which additions may be made as desired is the commonly accepted practice. Carrier gas characteristics which would most nearly satisfy all varieties of atmosphere operations may be used. Such a gas should be relatively inert to steel surfaces, that is, to carbon and iron. It should be capable of being easily made in large quantities, and should be relatively inexpensive. While the ideal carrier gas should be nonexplosive when mixed with air at low temperatures, the gas should at the same time be capable of a ready check to determine what its capacity is for decarburization.

An ideal gas should contain at least 20 per cent carbon monoxide; it would be satisfactory up to 30 per cent. The balance would be nitrogen. Carbon dioxide content must be held to a trace, and hydrogen must also be eliminated because of its explosiveness. No hydrocarbons are allowable in this ideal gas mixture.

From such a specification, a refined producer gas whose CO_2 might be removed would seem to be the answer. While such a carrier gas is now used in industry, no large scale production is feasible because of production difficulties; present generators of this gas composition are generally quite small. When the desirability of this composition is appreciated, it becomes evident that further development in its preparation would greatly reduce the problems of atmosphere applications, at least as far as steel products are concerned.

For a processing illustration, the manufacture of a spring formed from a flat plate will be discussed. The blank has a section of approximately 1/16-inch, 8 inches in diameter with a 4-inch diameter hole in the center. This blank is formed cold, in a conical corrugated shape. Steel must contain enough carbon to harden to 55 rockwell C in a die quench with oil as a coolant.

Of course this type of a blank made of SAE 1065 steel presents a variety of problems. Because of the high carbon content, and the care which must be

taken in rolling (the sheet must be cross rolled to meet required spring properties) the metal thickness cannot be held, and a grinding operation must be performed on each side of the plate. Since the forming operation on the finished blank is a very severe one, a spheroidizing treatment is required. Even with this softening of the metal, the drawing operation must be carefully performed to prevent cracks in the spring.

Present process uses a commercial low alloy sheet low in carbon (0.13 per cent). The sheet is rolled to size, eliminating the grinding operation; finish is excellent. These blanks are cold formed without the spheroidizing operation. Carbon is then added to the formed spring, so that the entire section is of a homogeneous carbon content. To obtain desired physical properties for this steel, the carbon must be maintained between 0.40 and 0.50 per cent. It is this addition of carbon with which we are particularly concerned.

A vertical pit type furnace with a 36-inch diameter by 48-inch deep retort is employed for this operation. A charge consists of nine strings of 38 springs each, or 342 pieces. Rods carrying the springs are suspended from a spider fixture and each spring is separated by a small spacer. Weight per spring is appoximately 1 pound and since the carbon content is to be raised from 0.13 to 0.45 per cent, slightly over 1 pound of carbon must be added to the entire charge.

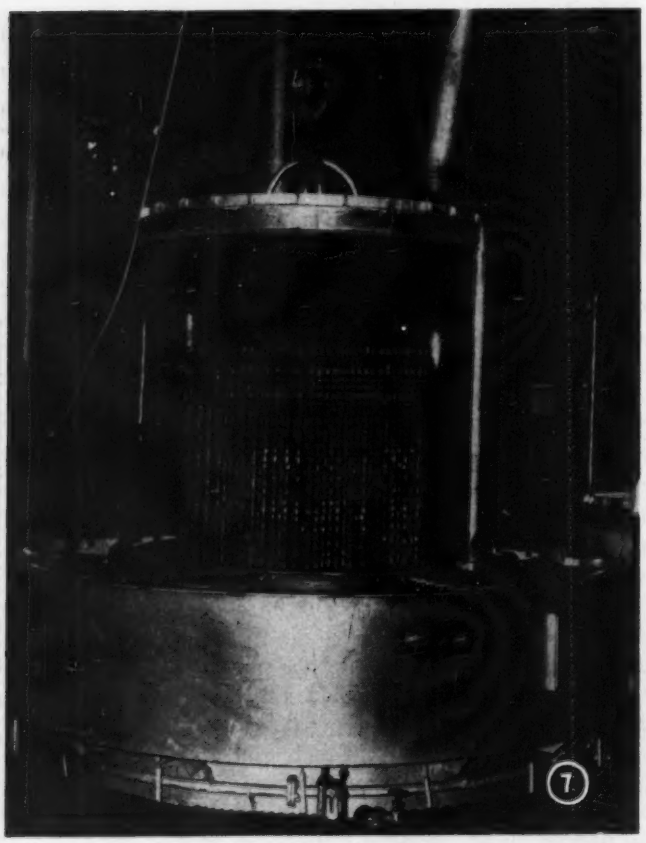


Fig. 7—Charge suspended from a removable cover for heavy case carburizing shafts. Here the fixture-load ratio is extremely small, and the handling problem is quite simplified

Immediately upon loading the heated retort, the carrier gas is supplied, and with it a suitable flow of natural gas. This is done to insure complete purging of the retort before the charge is heated to a temperature at which oxidation may occur. Function of the natural gas supply during the heating period is also one of providing an atmosphere of sufficient carburizing capacity before the rate of carbon demand by the steel becomes excessive. For such a light load, the rate at which carbon is absorbed by the steel becomes quite high as temperatures of 1600°F or higher are reached. This is due to the large surface area exposed to the gaseous medium. Heat input is cut to one half the initial rate as the thermocouple reaches 1525°F, in order to insure temperature uniformity for all parts.

Charge is held at 1625°F for 1 hour, which constitutes the effective time for adding carbon. Temperature is then raised to 1700°F and the natural gas supply is discontinued. After holding for 3 hours at this temperature, the load is allowed to drop to 1650°F by cutting off the heat supply. Function of this period is to permit the carbon concentration gradient to level out, and here the carrier gas composition is an important consideration. By maintaining a slight pressure in the retort, contamination with air is eliminated. During the diffusion cycle, the atmosphere must be practically neutral to carbon; that is, no carbon is to be added or taken from the steel surfaces. Diagram, Fig. 5, will illustrate the process in terms of carbon flow and stock thickness.

This illustration is given to bring out the importance of carefully controlled periods, both of gas supply and of heat application. Many commercial applications find gas an indispensable fuel in controlled processing. Shown in Fig. 7 is a charge suspended from a removable cover for heavy case carburizing of shafts. Here the fixture-load ratio is extremely small, and the handling problem is consequently quite simplified.

Much of the progress made in heating practice has been due to developments in refractories, heat resisting alloys and temperature controls. These we may not neglect; yet in preparing this article it seemed advisable, from the process standpoint, to develop a very general presentation of heating principles. From such a development it is hoped that processing problems may be analyzed in a somewhat quantitative manner.

Extreme variations in metallurgical requirements and production demands in the heat processing of metals necessarily make a presentation covering the needs for improvements quite general in character. Certainly an approach based on process fundamentals is helpful in determining what these problems really are.

From data presented by the author at conference of American Gas Association, Windsor, Ont., April 9-12, 1948

Seen and Heard in the Machinery Field

By GUY HUBBARD
Machine Tool Editor

CURTIS ANALYZES MACHINING: In an extremely interesting talk at the recent Machine Tool Forum in Buffalo, Myron S. Curtis, assistant director of engineering, Warner & Swasey Co., Cleveland, made clear to his large audience some of the fallacies of overemphasis of speed in cutting metal.

He mentioned having seen in the research laboratory of Aluminum Co. of America, an experimental lathe in which 8 inch diameter rolled aluminum bars were turned at 20,000 feet per minute, with ⅛-inch depth of cut and 0.020-inch feed. The chips came off in a continuous horizontal stream which struck a wall 30 or 40 feet from the machine. "All very interesting as a laboratory test," said Mr. Curtis, "but what could you do with that speed in a lathe if you had it?"

Mr. Curtis then went on to say that machine tool men now realize that the greatest strides toward greater productivity now can be made by focusing attention on handling time—rather than on excessive speeds and feeds. Here is the way he drove this point home.

"Last time I flew from Cleveland to Detroit, the actual flight took 28 minutes. Figuratively speaking, the 'machining time' was excellent. *But,* it took me an hour to reach the airport and 20 minutes of waiting before the plane took off. Then when I got to Detroit, it took another 20 minutes to get my luggage and myself into a bus and 1 hour and 10 minutes to get to my hotel. That made a total of 170 minutes. In other words, the 'handling time' was way out of proportion to the 'machining time'.

"Much effort and much money is being spent and will be spent, to cut down the flying time. That is the spectacular factor. Let's assume that next year I'll make this trip in 14 minutes, airport-to-airport. That represents 100 per cent increase in 'cutting speed'—but the overall increase in efficiency is only 7.3 per cent.

"However, if they can decrease the 'handling time' —time to and from the airports—only 50 per cent, that means an increase in overall efficiency of 44.7 per cent.

"Even if it takes me as long as now to get to and from the airports—but assuming that I have to wait 5 minutes for my plane, instead of 20 minutes, and for my luggage 5 minutes instead of 20 minutes—right there you have an increase in overall efficiency of nearly 16 per cent.

"And so I say, next time you are asked to build a machine for 3000 revolutions per minute instead of 1500—to save cutting time—be very sure that there isn't something else that can be done which will be far more helpful than high spindle speed in stepping up the overall production efficiency of the machine."

HE DEFENDS ATTIC INVENTORS: This week I want to pay tribute to Leroy A. Wilson of Gunlock, Utah, for a valiant defense of the "attic genius" who I said in the March 22 issue "doesn't fit the modern picture". Mr. Wilson goes on to say:

"About three years ago I visited an 'attic inventor' in Los Angeles who really worked in an attic and who was very poor. This man produced a 4,000,000 volt spark with dime store equipment. Also, he precipitated radium from solutions—without the tedious steps employed by others having advantages of ample finances and elaborate laboratories.

"Furthermore, I know some boys working under similar conditions of poverty who have a turbine which makes the one you describe look sick. They don't have to make all those metal tests you describe, for the reason that they have metals which are not subject to uncertainties. These boys actually mine their own ores, smelt their own metals, and these metals will operate at 1000° F higher than those you mentioned (1400°)."

Well, more power to these boys out there in the west. It certainly is not the first time that big things in the inventive and technological fields have come out of that part of our great country. The late John Browning, one of the greatest inventors of repeating and automatic firearms that this country has ever known, was a native son of Utah.

He learned his trade out there in a primitive gun shop in which there was a spring pole lathe—the "spring" being the branch of a living tree which overhung the shop. He did his inventing throughout his life out there in the great open spaces. However, having worked out the basic details of his guns, he then took them to large organizations such as the Colt Armory, where they were refined and put into mass production.

His genius was tempered with keen appreciation of what "big industry" could do for him. Therefore his inventions did not "die in infancy" as do all too many promising "brain children" of inventors who do not have facilities for bringing them to maturity in this modern world.

Mr. Wilson includes in his list of "attic inventors" a man whom he describes as "an unknown British inventor by the name of Whittle". I happen to know something about that case—having had the pleasure of meeting the now famous Air Commodore Frank Whittle in New York in the fall of 1946.

Air Commodore Whittle, highly trained mathematician and engineer, may have "dreamed up" his turbo-jet engine in relative obscurity, but its development was carried out by Powerjets Ltd., under control of the most careful scientific "checks and balances". The brilliant inventor who blows himself up in the course of his experiments, is not a success.

Mr. Wilson's ingenious friends out there in the great west are working with powerful and dangerous forces. I sincerely hope that they will succeed in interesting the right organizations with the right facilities for safe, large-scale commercial development.

Diverse Assembly Methods

Used To Build New Type Welder

Procedures followed in processing components in the manufacture of alternating-current units at the new Westinghouse Buffalo plant provide flexibility for continuous expansion to meet expected demands

RECOGNITION on the part of many metal processing manufacturers of the advantages offered by alternating current welding equipment, namely—virtual absence of arc blows, faster and better quality welds, low power consumption and maintenance cost—is having a decided effect on the production schedule of the 65 Flexarc alternating current welder currently produced in the new Buffalo plant of Westinghouse Electric Corp.

Although the production lines for this welder are still in process of further refinement, the company already is turning out units at the rate of about 8 to 10 per day with expectations of increasing the rate to about 15 or 20 shortly to meet demands.

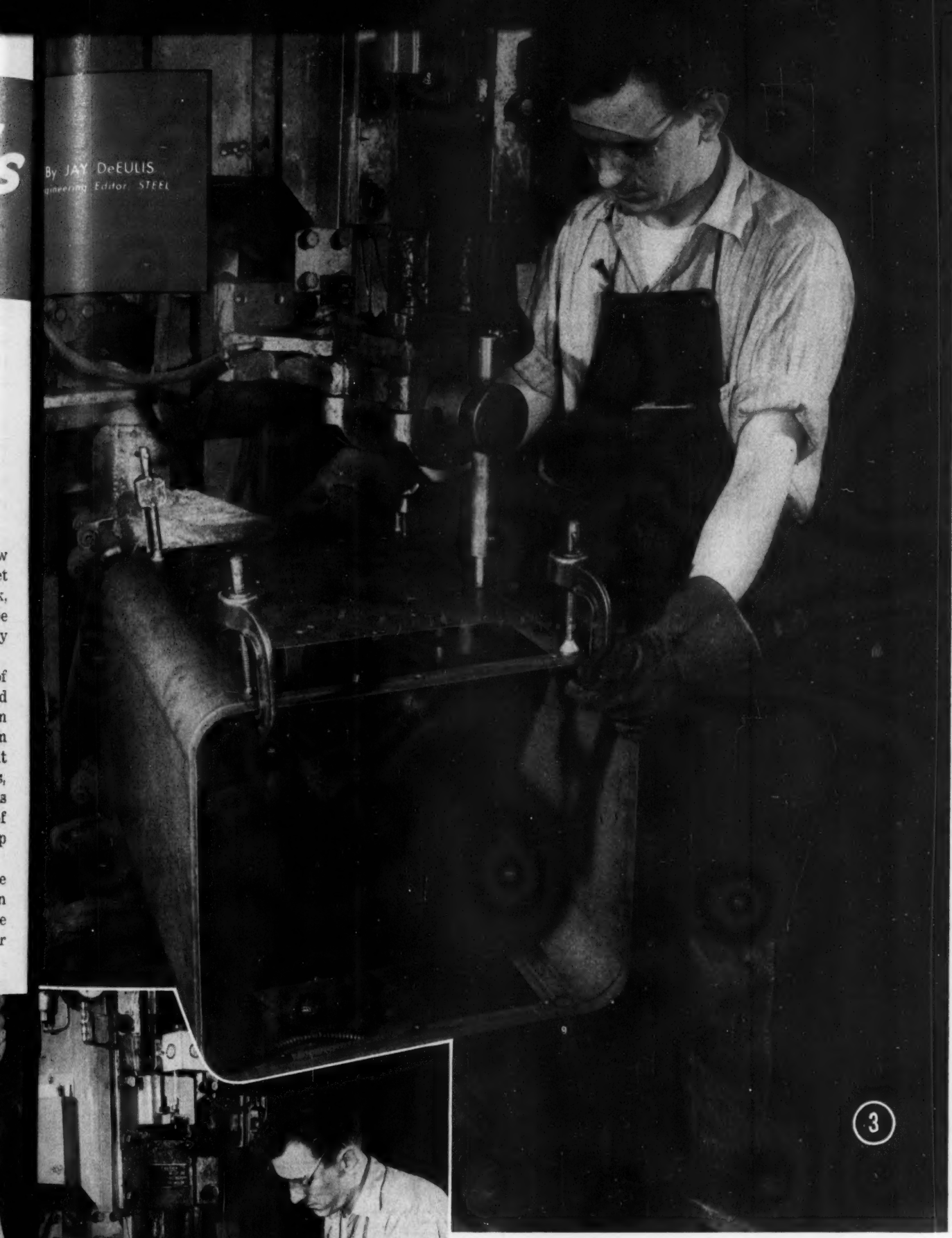
Representing one of the newest developments in the alternating current field, welding unit above is designed with open circuit voltages of 65 volts in order to allow ample margin in cases of low primary line voltages. It is pointed out that although certain electrodes are available for operation on open circuits as low as 50 volts, most commercial electrodes of the E-6011, E-6012 and E-6020 types develop occasional arc extinctions on open circuit voltages lower than 65 volts. Thus, in the past, to insure satisfactory welding operations, even in cases where the primary line voltage was low, it was the practice to design alternating current welders with an open circuit voltage of 75 volts.

Improved Arc Stability—This advantage is achieved by the welder produced in Buffalo through the use of a simple capacitor-resistor arc stabilizer circuit that makes possible improved striking characteristics and arc stability with any type alternating current electrode at open circuit voltages as low as 55 volts. This low open-circuit-voltage design in combination with Hipersil cores, and improved high permeability iron that carries 30 per cent more flux, makes possible a welding transformer that is small, light in weight and high in efficiency.

Fabricating Procedures—Nearly all types of fabricating operations come into play in the production of this welder—shearing, bending, drilling, welding, stamping, degreasing, finishing, to name a few. Raw materials involved in these operations include sheet steel, expanded sheet steel, bar and angle iron stock, Micarta sheet and tubes in addition to Hipersil type C cores which are shipped in and stored until ready for use.

Basically, the welder is processed in the form of five subassemblies—base, frame, case, a reactor and transformer. Two frame ring halves, two angle iron supports, four skid or swivel wheel nuts and a screen make up the base. The frame consists of two upright channels, one bottom and two center cross channels, two angle iron feet, four capacitor mounting brackets and two terminal board brackets. A panel for each of the four sides, a pair of louvers and a cover make up the case.

Reactor provided includes a copper strap single winding coil, two Hipersil C-shaped cores, a silicon iron core block and silicon iron movable core as the main parts. Main transformer also includes a pair



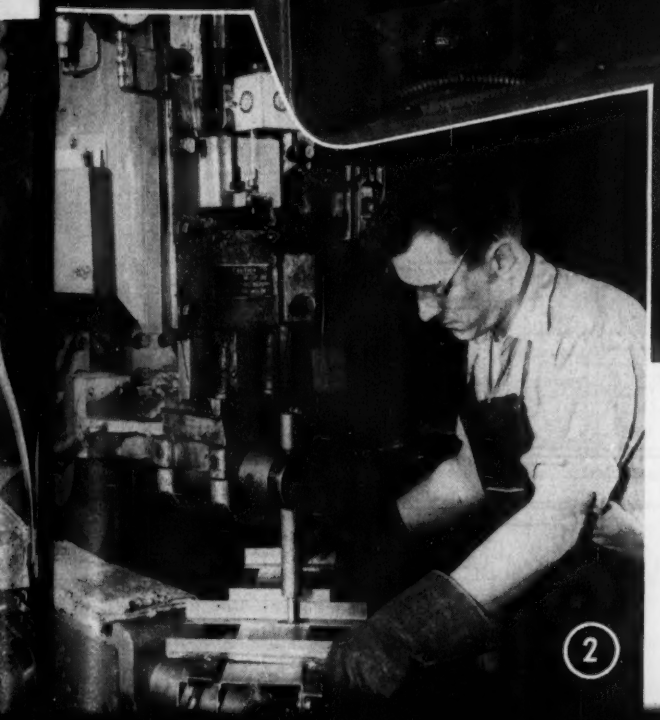


Fig. 1—Third of the three steel straps is here being sealed with a sealing tool on this completed transformer

Fig. 2—Spot welding operation joining together an upright channel, four capacitor brackets and a terminal board bracket with aid of fixture

Fig. 3—Panels here are held in place by C-clamps while spot welded. Welds are spaced on 6-inch centers

of Hipersil C-cores, a copper strap 3-winding coil and insulation.

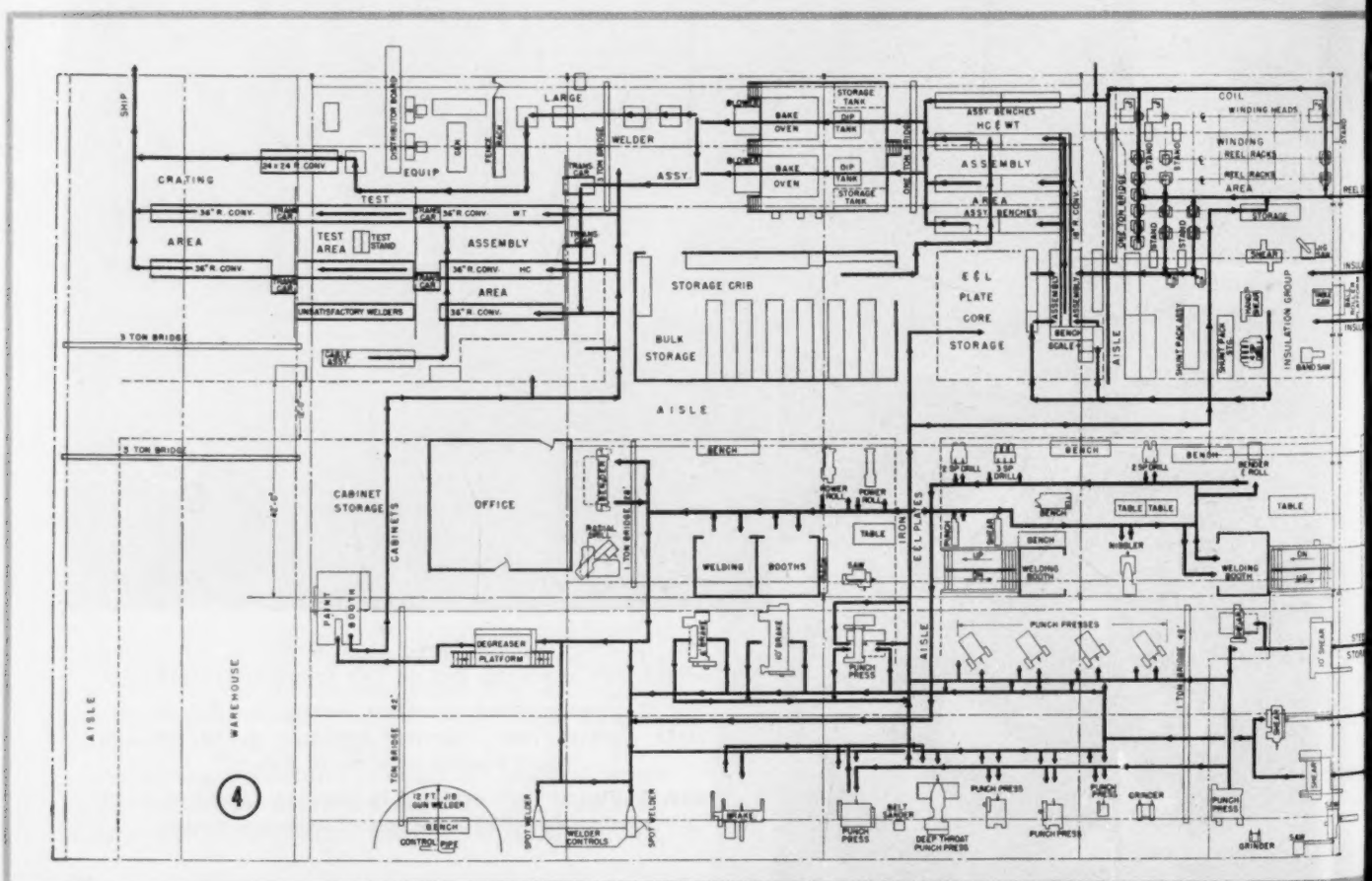
Handling Devices Used—In processing materials through the various operations, a variety of handling equipment is utilized. For example, in moving small sheet metal, angle iron and bar stock components, tote pans moved on roller devices are used. Large sheet metal parts are moved on skids by fork trucks. Lifting and spotting operations are accomplished by 1 and 3-ton floor operated bridge cranes, while 36-inch roller conveyors serve the assembly line. Flow of production sequences may be followed by referring to the diagram, Fig. 4, which shows the subassembly production line prior to joining the main assembly operations.

Subassembly operations in the plant consist of processing components required for each of the basic portions of the welder. During the processing of the frame, the frame ring halves which consist of ¼ x 1¼-inch or ¼ x 2-inch cold rolled bar stock previously sheared to length on a 120-inch Cincinnati shear, and bent to shape on a 72-inch Cincinnati power brake, are positioned in a holding fixture for joining by arc welding. Tack welds are made at each end of the ring with a 200-ampere alternating current welder together with a 3/16-inch rod. Next, the four skid nuts are positioned in the fixture and welded to the frame ring corners. Angle iron supports for both the frame ring and transformer, consisting of ¼ x 1½ x 1½-inch cold rolled angle iron, are positioned in the fixture and welder to the frame ring sides. Finish welds at each end of the frame ring are made after the assembly is removed from the fixture.

Fixtures Aid Welding—Extensive use of fixtures is made in the assembly of the frame itself. For example, one of the upright channel members and the four capacitor brackets and a terminal board bracket are positioned in a fixture in order to join the brackets to the upright channel by spot welding. This is followed by the positioning of the matching upright channel and the other terminal board bracket—a 0.078-inch hot rolled steel sheet—in another fixture to spot weld the bracket to the upright channel. Both fabricated upright channels and the bottom cross channel are next positioned in a fixture and arc welded, followed by the addition of the two angle iron feet also by arc welding.

Offsets included in the 0.625-inch hot rolled steel-sheet side panels are used to position front and rear panels for spot welding in the assembly of the case. During the welding operation, C-clamps are used to hold the panels in place and welds are made on 6-inch centers, Fig. 3. Cases are then put through a degreasing treatment in a Detrex batch type washer by means of a special chain sling capable of handling two cases simultaneously. From there they are taken to a water wash spray booth and spray painted with red oxide, air-dry primer and a light gray enamel, air-dry finish. Upon drying, the cases are stacked on pallets until needed on the main assembly line.

Louvers of the welder units are fabricated of 0.625-inch hot rolled steel sheet, being sheared to length and width on a 120-inch Cincinnati shear. A Niagara punch press using a blanking and piercing die is utilized to blank out in one operation the six screw holes and center openings required. As in the case of the louvers, the louver fins also are sheared to proper



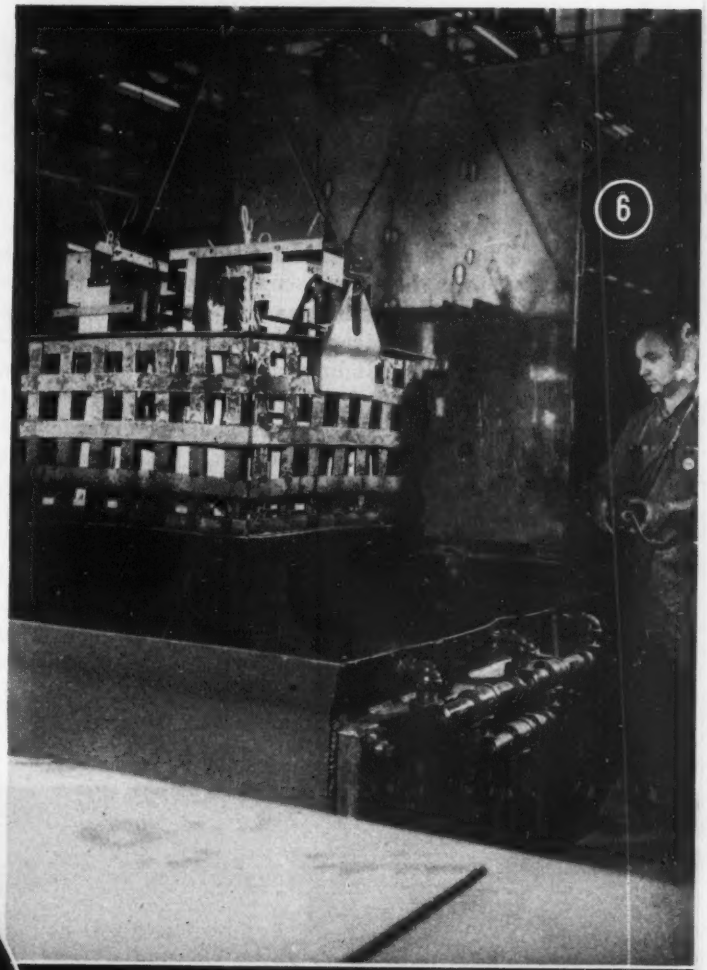
length and width on the Cincinnati shear. Then both frame and fins are positioned in a holding fixture and joined by spot welding. Fabricated louvers then are placed in a basket for degreasing and finishing.

Transformer Assembly—Main transformer coil and core are assembled in a different portion of the plant as shown in Fig. 4. The main coil is made from an asbestos-covered copper strap wound on a standard coil winding machine. An expanding mandrel is used to form the coil which is rectangular in shape with rounded ends.

The finished coil is composed of two high voltage turns, one low voltage turn, one capacitor turn, one low voltage turn and two high voltage turns. Both high voltage and low voltage turns are connected in series. As the coil is being wound six Micarta spacers are inserted between the high voltage, low voltage and capacitor sections at the coil end to form ducts for cooling. Further protection and insulation is provided the wound coil by glass or asbestos tape.

Each finished main coil then is inspected on a "turn counter" by comparing it to a "standard" coil.

Coils passing inspection are next assembled with their cores. This consists of placing the coil on the



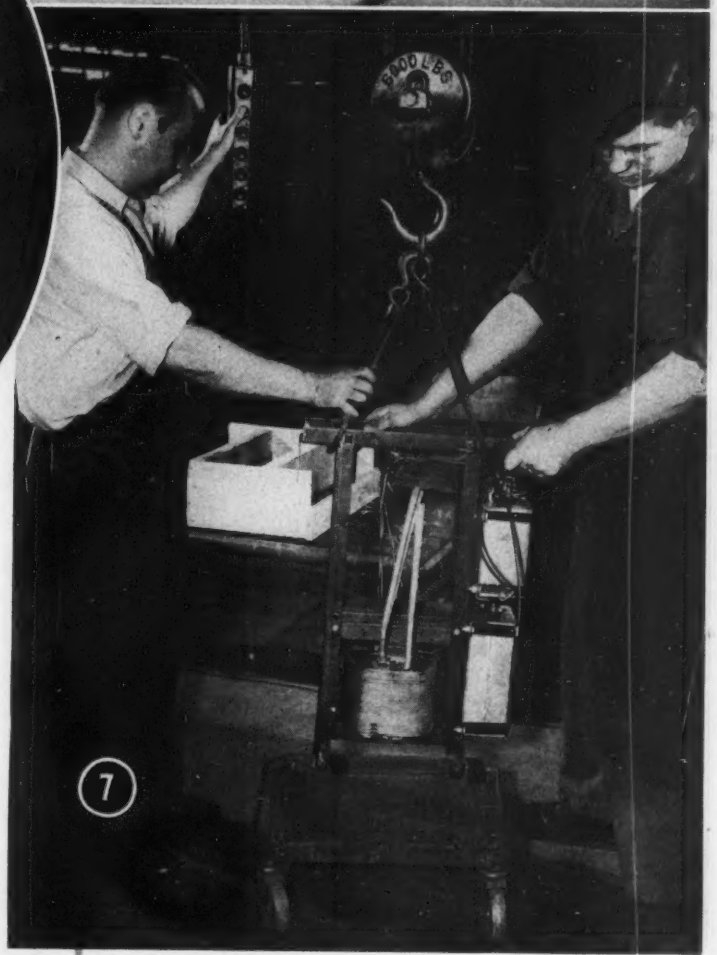


Fig. 4—Alternating current arc welder manufacturing area

Fig. 5—Positioning of main transformer in frame which is held by a cross channel member fastened to upright channels

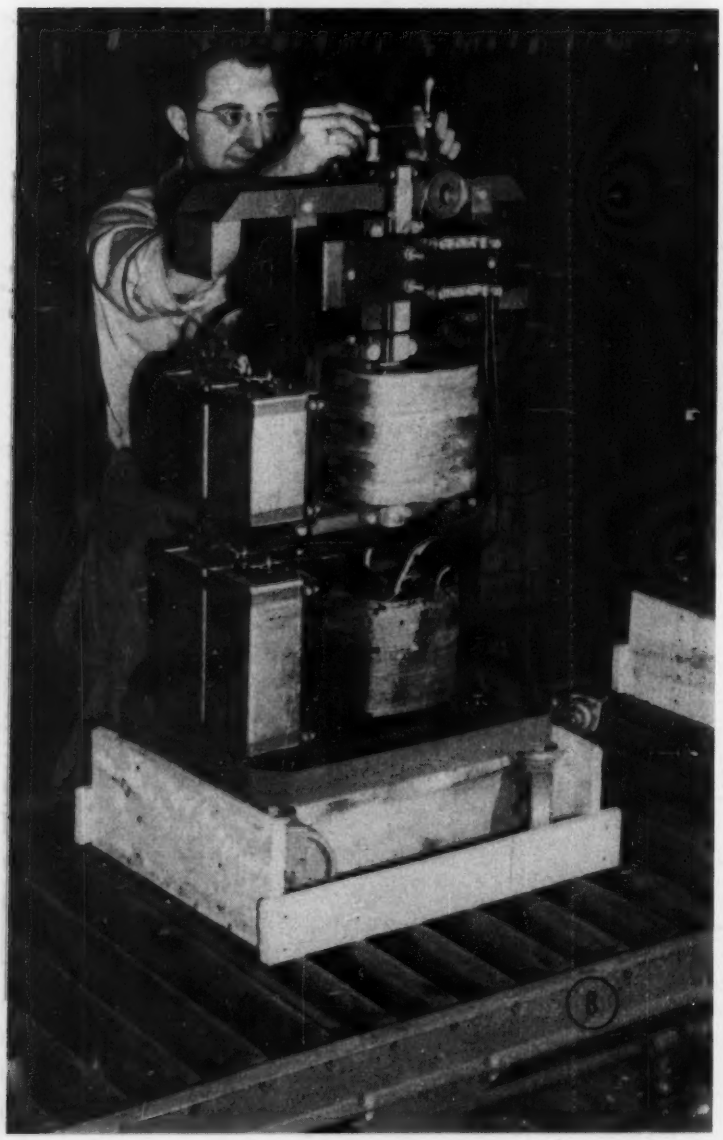
Fig. 6—Basket used for dipping frame and transformer in insulating varnish. Four units are handled at one time by the basket

Fig. 7—Positioning of frame and transformer on base

bottom half of two Hipersil C-cores previously positioned on a work bench. The top half of each core is then positioned over the coil and matched with the bottom half before being bound tightly together with steel bands as shown in Fig. 1. The cores, incidentally, are supplied to the plant by company's Transformer Division at Sharon, Pa.

Assembly of the reactor coil and core in some respects follows the operations used in processing the main transformer coil and core. As in the previous case, asbestos covered copper strap is wound over an asbestos paper Micarta tube on a standard core winding machine, an expanding mandrel holding the tube during the winding. The finished coil is composed of one continuously wound section of six layers. Micarta spacers also are used between layers at the coil ends to form cooling ducts. The coil is protected and further insulated with glass or asbestos tape before being tested.

Coils passing inspection are loaded into a basket for dipping in insulating varnish. After impregnating for 30 minutes in class B varnish, the basket of coils is moved to a batch type oven for baking. Here the varnish is cured for 8 hours at 125 to 135° C before being removed to a cooling area.



Coil and Core Assembly—Each insulated coil is assembled with its special core as follows: Coil is first placed over the core block and temporarily rested on two blocks lying parallel to the coil sides. A piece of ⅛-inch thick asbestos paper Micarta, cut to fit between the asbestos paper Micarta stationary guide rods and to fit the outline of the coil bottom, is placed over the core block and under the coil. This piece of Micarta serves a dual purpose. It provides an air gap filler between the movable coil and core block, and a centering device for the reactor coil with respect to the stationary guide rods. Two Hipersil C-core halves then are slid into position, using the frame cross channel as the skidway. At this point, the two blocks are removed and the core halves are locked into position by two steel bands under spring tension. The movable silicon steel core is slid into place inside the Micarta tube that forms the inside liner of the coil.

Main Line Assembly — On completion of the required subassemblies, they are all moved toward the main assembly area. Here the main transformer is positioned in the welder frame and permanently held there by a cross channel member that is fastened to the frame upright channel members with self-tapping screws, Fig. 5. The frame and transformer, Fig. 6, are then loaded, four to a basket, for dipping in insulating varnish. Following impregnation for about 30 minutes in class B varnish, the basket is moved to a batch type oven for baking which enables the varnish on the frame and transformer to be cured at 125 to 135° C. This takes about 8 hours.

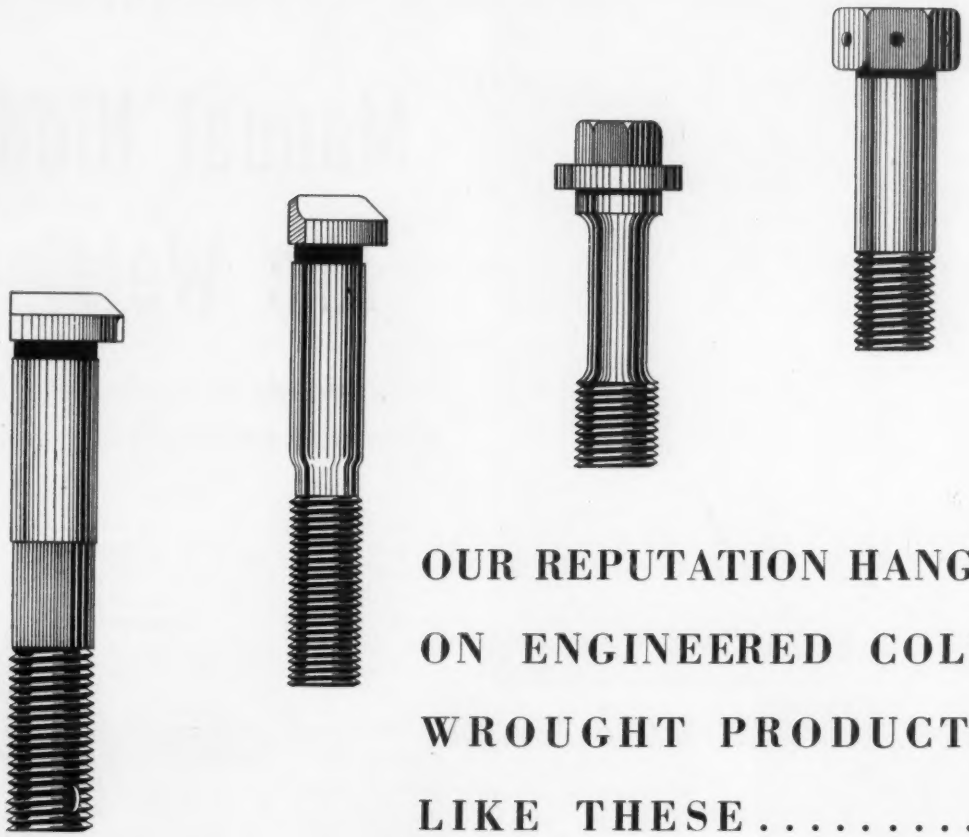
After cooling, each frame and transformer is positioned on a welder base and permanently attached to it with tap bolts, Fig. 7. Whole assembly then is positioned on a pallet and staked down. At this point the pallet is on a transfer car for transportation to the 36-inch roller conveyors used in the main assembly area. Because of the height of the welders, the conveyors are only 18 inches above the floor.

After the palletized assembly is once on the conveyor, the primary and secondary capacitors are added to the frame. The primary capacitors are connected to the capacitor winding of the transformer, and leads are run from the high voltage coil in the transformer to the primary terminal blocks. The reactor coil and core is positioned in the frame and permanently held there by the top frame cross channel and the frame cross channel that serves as a base for the core blocks. These are fastened to the frame upright channel members with bolts and nuts.

Wiring is completed by connecting the reactor coil to the low voltage winding of the transformer and connecting these components to the secondary terminal blocks. Secondary capacitors are connected to the welding lead connection terminals.

Final operations at the end of the moving conveyor line include installation of welding current adjusting components and attachment of the case and cover to the chassis, readying each welding unit for final testing.

Fig. 8—Nearly completed welder being prepared to receive case and cover



OUR REPUTATION HANGS ON ENGINEERED COLD WROUGHT PRODUCTS LIKE THESE.....

Here are four of our metal fasteners selected at random. Although each one is merely a metal pin, headed and threaded, costing only a few pennies, each one has been designed and wrought with infinite care. In all assemblies where metal fasteners are used, the fasteners bear the greatest burden of responsibility. Therefore, CHANDLER stands back of the work *these* fasteners do for *you*. Our reputation actually hangs on our cold wrought engineered products. No wonder, then, that we bend every effort toward living up to our purpose: one product, well made, designed painstakingly and executed to particular specifications for practical purposes.

CHANDLER PRODUCTS CORP.
1491 CHARDON RD. CLEVELAND 17, OHIO

Fig. 1—Power driven positioner is used in making round-about weld for a circular section. To start arc, operator touches electrode wire to work and starts the positioner. He lifts gun to stop wire feed and break arc

Manual Hidden Arc Welding

. . . speeds manufacture of chemical and refinery equipment

By J. L. WOLCOTT
District Engineer
Lincoln Electric Co.
Cleveland

WELDING speeds three to five times faster than were possible with regular hand welding are increasing the output of chemical and refinery equipment at Steel and Alloy Tank Co., Newark, N. J. Development of simplified equipment for the manual use of hidden arc welding by Lincoln Electric Co., Cleveland, has extended advantages of the process formerly possible only with automatic equipment.

Since this refinery equipment is made in limited quantity and in varying sizes and shapes, it was previously impossible, either economically or physically, to use hidden arc welding with fully automatic equipment. The new, portable, self-sufficient unit provides all the necessary welding current and auxiliary power plus automatic wire feed and controls. Basic element of unit is a standard 600-ampere welder which can be used either for regular manual welding or for manual hidden arc welding.

Automatic Electrode Feed—Electrode wire is fed automatically to work through a granular flux that is deposited by gravity from a welding gun. Wire is fed from reel and through special cable to the gun at proper speed for amount of current being used. Cable is rubber-covered stranded copper with a closely wound coiled spring in the center, and serves as a light flexible carrier for both welding current and electrode wire. Process uses a $\frac{5}{64}$-inch diameter electrode to provide ease of operation in manipulating gun.

Constant arc voltage is maintained automatically permitting gun to be raised or lowered to regulate flow of flux needed to cover arc completely. Because wire is fed through gun nozzle at rates generally around 300 inches per minute, and current is introduced to wire close to arc, it is possible to use 600 amperes with a $\frac{5}{64}$-inch electrode whereas an elec-

(*Please turn to Page* 112)

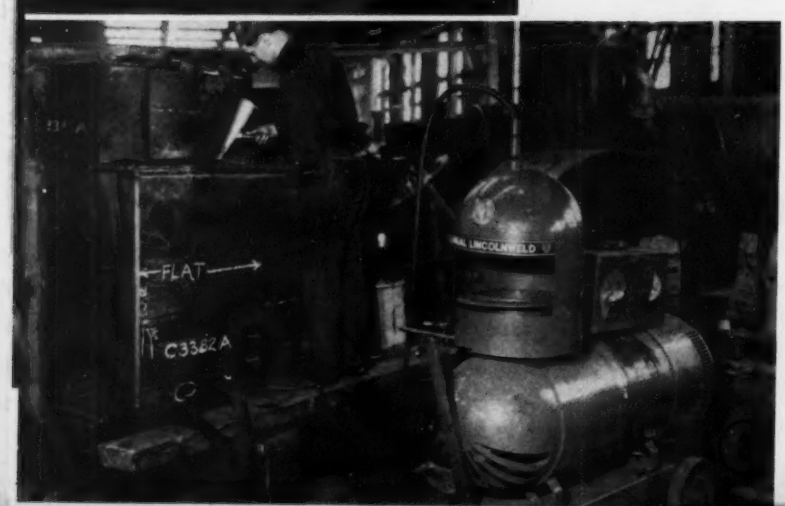


Fig. 2—Inside fillets on a scroll-shaped casing are made without spatter, smoke and visible arc rays

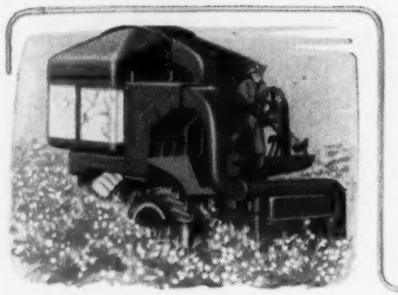
Fig. 3—Operator depositing a $\frac{5}{8}$-inch fillet in $\frac{3}{4}$-inch plate makes three passes with a machine setting of 375 amperes at a speed of 14 inches per minute

You'll be amazed at what can be made with Bundy Tubing!

Do you make things . . . on a *big* scale, or *small* scale? Are you toying with a new idea? Or even *looking* for one?

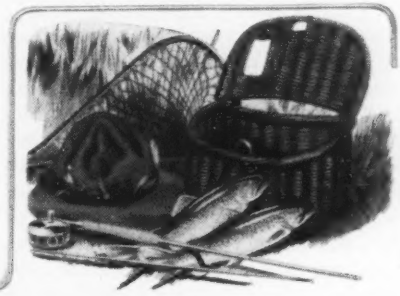
Then this is for you. See where Bundyweld* Tubing has helped get production under way—or off to fast, fresh starts, with boosted quality and lowered costs.

Examples? Sure—some proved, some recent, some brand new. One might be the application for you—or spark a project of your own.

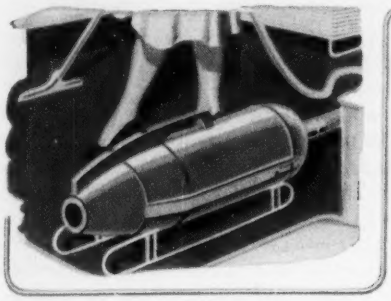


1 **"Innards"** of Bundyweld help this newly developed, one-man cotton picker do its amazing job. Bundyweld, double-walled from a single strip, is at work in almost everything automotive . . . ideal for brake systems, fuel lines, many other rugged uses.

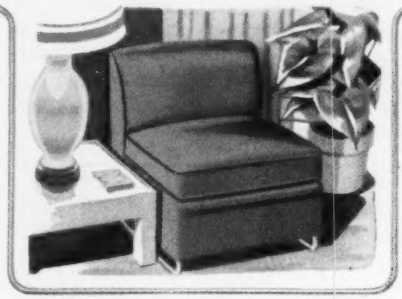
2 **Fresh, tasty** miracles come year-'round from new home freezers. Inside, coiled and ready, Bundyweld helps keep them cool and flavorsome. In condensers, and under parkas of frost in evaporator coils, Bundy does a big job in refrigeration.



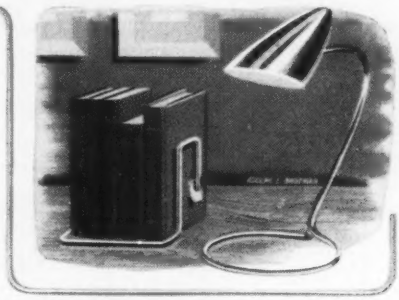
3 **Nothing rusty** about *this* fisherman! Or about his fishing rod, either, thanks to a recent inspiration: using Bundyweld Monel Tubing for *corrosion-resistant* rod tips. There's just no telling where Bundy will turn up next. Another "for instance"—



4 **Much of** the ease of modern housecleaning is in the effortless way this tank-type vacuum cleaner can be kept "to heel." Strong, double-walled Bundyweld runners slide *smoothly* and wear almost forever. Are light and easy to fabricate, too.



5 **And at** every turn, new, *untried* ideas. For example, if Bundyweld runners work wonders on vacuum cleaners, why not put them on *all* heavy furniture where you want smooth movability? Untried, *sure*—but it might easily work to *your* profit.



6 **Or why not** sleek, telescoping book ends in bright, light Bundyweld? And maybe table lamps of coiled Bundyweld to match? Or your own idea? Who knows where Bundy Tubing, used imaginatively, can help turn drab "today" into tomorrow's dream-stuff!

7 **Bundyweld steel,** Monel and nickel tubing has made many undeveloped ideas workable. Bundy engineers, too, have often suggested the tubing application that solved a hard production problem. Their assistance with your idea may help you harness it more practically, profitably. Call or write *Bundy Tubing Company, Detroit 14, Michigan.*

BUNDY TUBING

REG U.S. PAT. OFF.

ENGINEERED TO YOUR EXPECTATIONS

®

WHY BUNDYWELD IS BETTER TUBING

1 Bundyweld Tubing, made by a patented process, is entirely different from any other tubing. It starts as a single strip of basic metal, coated with a bonding metal.

2 This strip is continuously rolled twice laterally into tubular form. Walls of uniform thickness and concentricity are assured by close-tolerance, cold-rolled strip.

3 Next, a heating process fuses bonding metal to basic metal. Cooled, the double walls have become a strong ductile tube, free from scale, held to close dimensions.

4 Bundyweld comes in standard sizes, up to 5/8" O.D., in steel (copper or tin coated), Monel or nickel. For tubing of other sizes or metals, call or write Bundy.

BUNDY TUBING DISTRIBUTORS AND REPRESENTATIVES:

Peirson-Deakins Co.	Lapham-Hickey Co.	Rutan & Co.	Pacific Metals Co., Ltd.	Eagle Metals Co.	Alloy Metal Sales, Ltd.
823-824 Chattanooga Bank Bldg.	3333 W. 47th Place	404 Architects Bldg.	3100 19th St.	3628 E. Marginal Way	881 Bay St.
Chattanooga 2, Tenn.	Chicago 32, Ill.	Philadelphia 3, Pa.	San Francisco 10, Calif.	Seattle 4, Wash.	Toronto 5, Canada

Bundyweld nickel and Monel tubing is sold by International Nickel Company distributors in all principal cities.

Conveyorization INCREASES STEADILY

In Metalworking Plants

Survey of 2000 metalworking establishments reveals healthy condition as to present and future use of various types of conveyors. Of all plants now using this means of handling materials, approximately 10 per cent of the installations were made since the war ended

HEAVY trend toward increased use of conveyors in the metalworking industry is indicated by a survey recently completed by STEEL. To determine the extent of conveyor use, types employed, probable outlook for future business, researchers queried some 2000 typical plants, balancing this sample of the 30,000-plant industry as to employment strata and products manufactured. Returns totaled 25 per cent. These were carefully screened to eliminate any possible bias.

Bar chart, Fig. 2, shows the distribution of conveyor installations by size of plant. As might be expected, the larger the plant, the greater the need for mechanized handling and hence the high percentage of conveyors used.

To determine whether the product manufactured has any effect on conveyor use, STEEL utilized the major metalworking industry groups of the standard industrial classification as a basis. Breakdown of returns indicates a wide variation from top to bottom. Table I shows that highly mechanized operations of steel plants, auto assembly plants and auto parts makers raises the level of those groups considerably above the makers of instruments, where considerable high precision work is required. It also indicates a substantial untapped market in every products group.

In Fig. 1, the number of plants using each of the four major types of conveyors is broken down by size according to employment. The amount of conveyor in feet is also indicated to show the relative importance of the various size groups in terms of total conveyor use.

Admittedly, past history is only a partial guide to the future of any market. However, conveyor installations to date indicate that of all plants where conveyors have been installed, the plants employing over 500 account for far more than their proportionate share of the total installations, regardless of the type of conveyor, and that plants employing less than 100 have far less than their share of the conveyors of all types. The middle group, employing from 100 to 500, accounts for more than its proportionate share of gravity roller and overhead conveyors, but less than its share of power roller and belt conveyors.

Analysis of the survey returns shows that the class of products

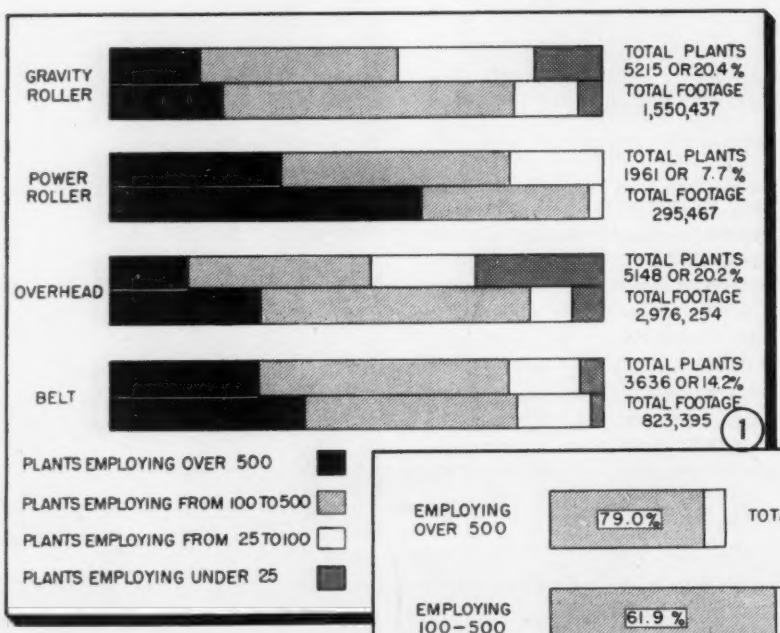


Fig. 1—Number of plants using each of the four major types of conveyors, broken down by size according to employment

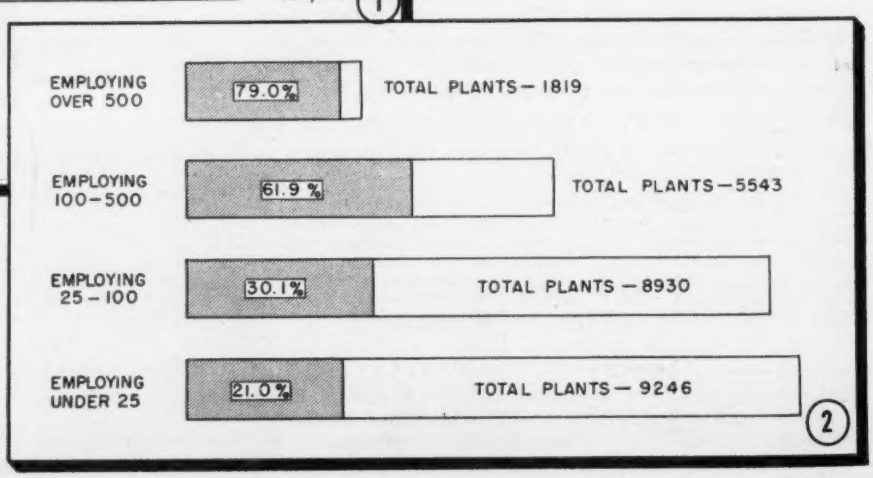
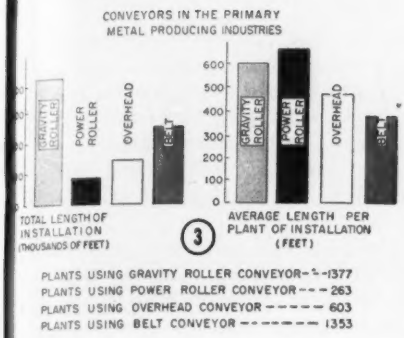
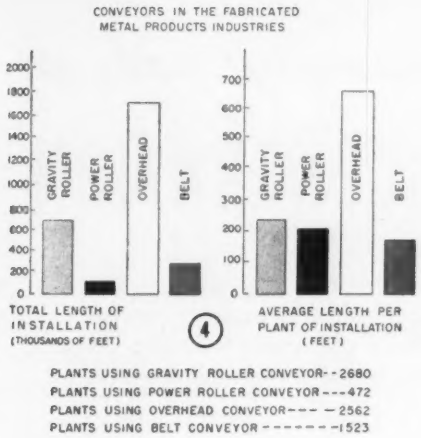
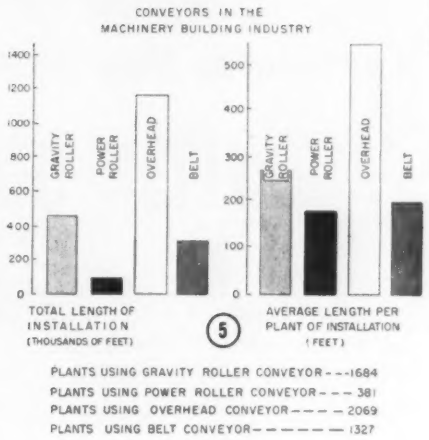
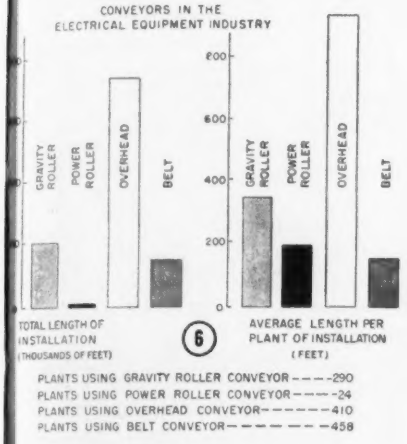


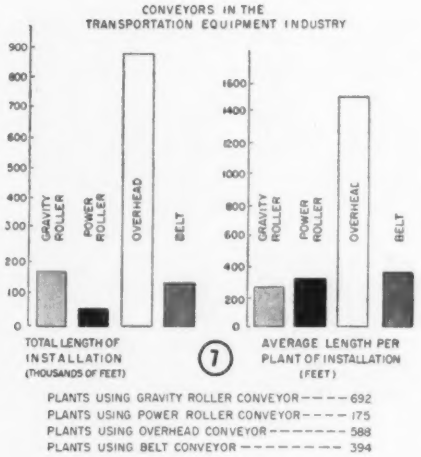
Fig. 2—Plants using conveyors of any type, classified by employment











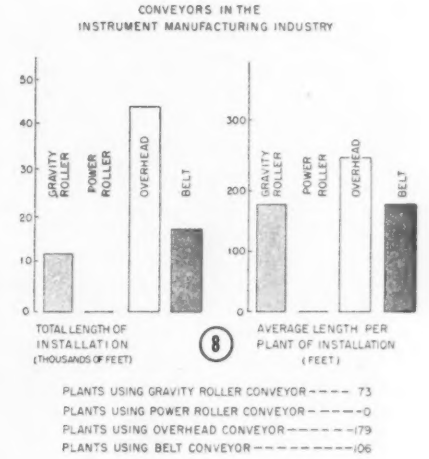


TABLE I

INDUSTRY GROUP	Per Cent of Plants Using Conveyors
Primary Metal Producers ..... Including steel mills, foundries, nonferrous metal smelters and rollers, forgings producers, etc.	55.9
Transportation Equipment ..... Motor vehicles and parts, aircraft and parts, shipbuilders, railroad equipment, bicycle and motorcycle producers, etc.	47.9
Electrical Machinery & Equipment. Domestic and industrial electric equipment, communications equipment, electrical products for transportation equipment, etc.	46.0
Fabricated Metal Products ..... Containers, cutlery, heating and plumbing equipment, metal furniture, light metal specialties, structural and plate products, sheet, strip, wire and bar products, lighting fixtures, etc.	40.7
Machinery ..... Engines, tractors, agricultural and industrial equipment, processing machinery, office and store machines, household machines, special industry machinery, machine tools, etc.	31.0
Instruments ..... Medical, surgical, dental, scientific and industrial instruments and devices.	24.1

TABLE II
DISTRIBUTION OF PORTABLE CONVEYORS

Plant Size	Per Cent of total plants in this group	Per Cent of total conveyor installation in this group
Over 500 employes..	23.0	30.7
100-500 employes...	37.0	48.5
25-100 employes...	22.8	11.7
Under 25 employes.	17.2	9.1

The average length of portable conveyors used is 37 feet.

manufactured by a plant has much to do with the type and amount of conveyor used. Using the major metalworking industry groups established by the standard industrial classification, Figs. 3 to 8 indicate both the total amount of conveyor installed by the various classes of products manufactured as well as the length of the average installation in feet.

Portable Conveyor Units—In addition to permanent installations, many plants are now using portable conveyor units as supplementary handling devices. There are many applications of the portable conveyor in production operations, in storage, and in shipping. Both standardized units and specially-built devices have their place in this picture. Of the 9500 plants in the metalworking industry using conveyors, 3545 now use portable conveyor units of some type. The pattern of distribution is fairly close to the permanent installations, as show in Table II.

Of all plants in the metalworking industry, 13.9 per cent use portable conveyors now. Only 0.4 per cent of these plants have installed portable conveyors since the war, but the study shows that an additional 1 per cent have been studying the possibilities and expect to buy portable conveyor units in 1948.

In order to determine the extent of present expansion in conveyor installations, part of this study was devoted to the types and volume of new conveyors installed since the end of the war, and the expected expansion during 1948. An analysis of these figures shows a heavy trend toward the use of more conveyors. Of all plants in the metalworking industry, 17.8 per cent installed conveyors after the end of the war. Right now, 47.7 per cent of the plants using conveyors have either added to their installation or installed a complete system since the end of the war.

—o—

Battery powered timbering machine was announced recently by industrial truck division of Baker-Raulang Co., Cleveland, for work in conjunction with trackless gathering systems in coal mines. The tractor type machine mounts a hydraulically-controlled boom which lifts the cross bar and holds it against the roof while posts are cut to length on circular saw mounted on machine.

Completes New Laboratory for Study of

TACONITE CONCENTRATION

Mining company in Lake Superior district engages in long-range research program to develop suitable process for low-grade iron ore beneficiation. District ultimately will ship concentrates with a portion of underground direct-shipping ores to the steelmaking furnaces in this country

TACONITE ore concentration methods will be developed in the new iron ore research laboratory established by the Oliver Iron Mining Co., Duluth, Minn., to extract iron-bearing minerals from this and other ores on a commercial scale.

During the war years, average annual shipments from the Lake Superior region iron mines were nearly double the average for the previous 30 years. While not expected to continue at this rate in normal times, these increased shipments have resulted in greater interest in plans and research for beneficiating lower-grade ores in order to conserve our supply of high-grade, direct-shipping ores.

Long-range, intensive research is necessary if economical and practical iron ore beneficiation processes are to be developed. From a national standpoint, it is extremely important to the United States that methods be worked out for adding these lower-grade ores to potential reserves, to assure future self-sufficiency in iron ore supply.

Grade, recovery and fineness of product are interdependent in iron ore beneficiation processes, and the relative importance of these factors will be determined as part of the research program. Essentially, the problem consists of three main factors: Gangue elimination and iron recovery (both to as high a degree as possible), development of low - cost concentrating methods, and agglomeration.

In the past, the ore supply available from the Lake Superior district consisted mostly of high-grade underground and open pit "direct-shipping" ores provided in concentrated form by the processes of nature, supplemented by varying amounts of concentrates.

Concentrating processes of the past are reasonably simple. Wash ores are dressed with little preliminary crushing, followed by washing away the excess sand. While the iron and sand contents of some other ores are more intimately associated, the problems of crushing and washing have been easily met.

Taconite, however, is the hard rock in which the ores of the Lake Superior region are found. Iron ore, in fact, was derived from this rock during eons of natural chemical leaching. What nature took her own time to achieve, the mining industry now seeks to do by dressing operations measured in thousands of tons in a single hour.

Since, broadly speaking, taconite contains only 25 to 35 per cent iron, the rock must be crushed and then ground to a powder as fine as ordinary cement before the valuable iron particles are freed from silicon particles and can be separated for easy concentration. Moreover, taconites vary widely in chemical composition and the nature and distribution

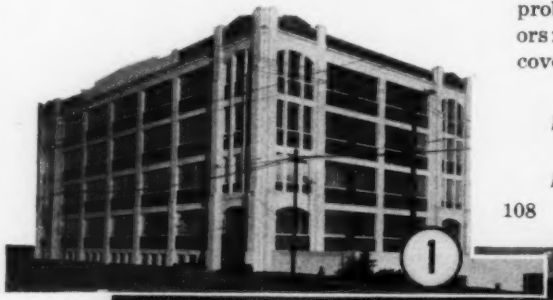
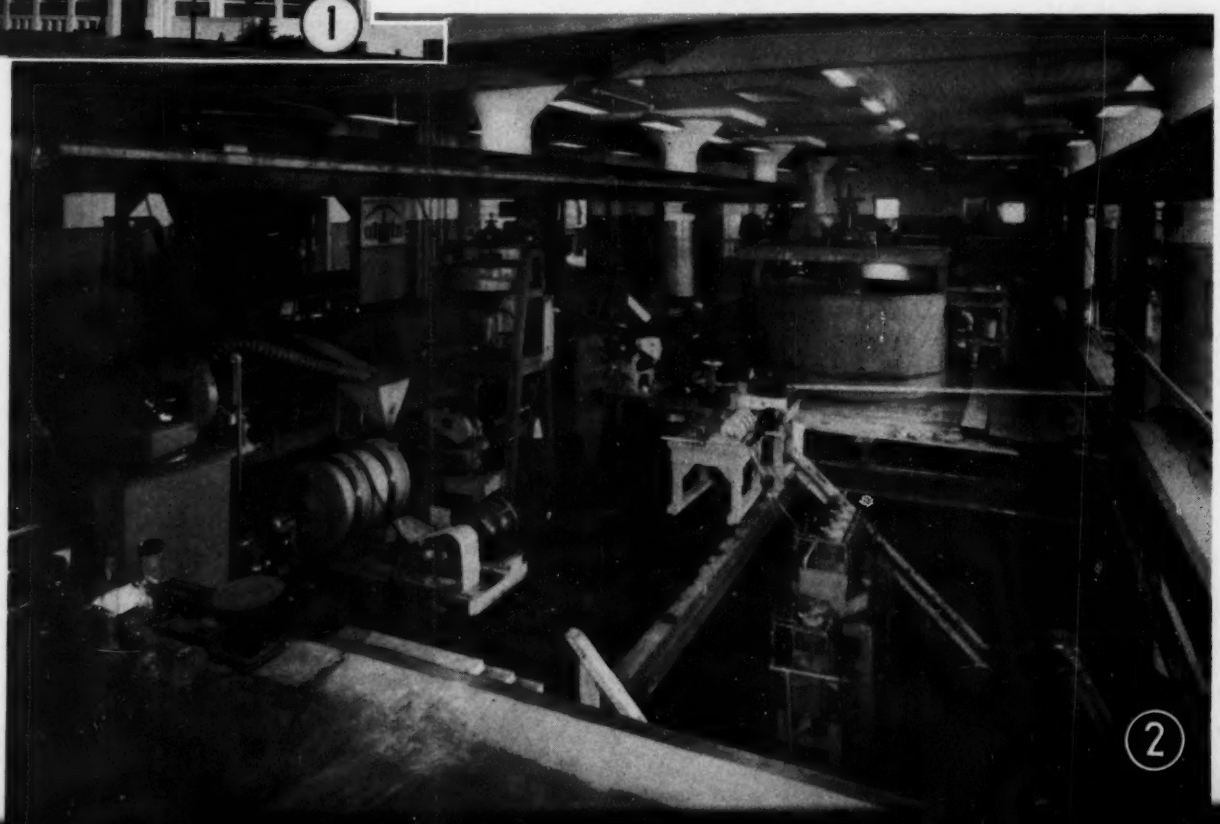


Fig. 1—New research laboratory of the Oliver Iron Mining Co. at Duluth, Minn.

Fig. 2—Pilot plant area on first floor showing different levels for equipment of experimental ore flow sheets



How Will You Have YOUR Tubing?

If *you* manufactured caulking nozzles, you'd solve most of your production problems on your purchase order! You'd merely specify OSTUCO Tubing, formed and fabricated to your own blueprint requirements, and OSTUCO engineers and craftsmen would turn out the finished parts that would simplify assembly operations.

Threading, Angle Cutting, Shaping, Flattening . . . these and a host of other production problems are being solved daily through the use of OSTUCO production-assistance. You can get the complete story, without obligation, by writing to the nearest Sales Office. Find out today how OSTUCO Tubing can cut your production time and costs.

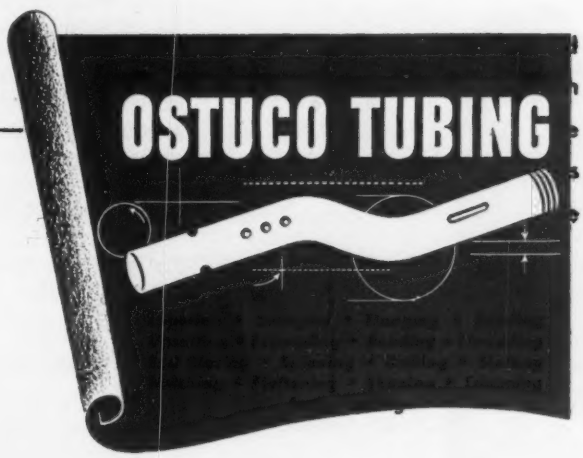
WHAT'S YOUR PRODUCT?

HAND TRUCKS?

If you manufactured hand trucks, you could slash production costs by having OSTUCO provide tubing produced to your specifications, with the difficult jobs of bending, flattening and piercing already completed. Whatever your product, there's a good chance that OSTUCO Tubing can help produce it in less time, at lower cost.

BUS SEATS?

Bending, flattening, piercing and trimming . . . all four of these complicated fabricating and forming operations are handled by OSTUCO in producing a better bus seat frame for a nationally-known manufacturer. If your production costs are a problem, better turn to tubing—OSTUCO Tubing —for the solution.



THE OHIO SEAMLESS TUBE COMPANY

***Plant and General Offices:* SHELBY, OHIO**

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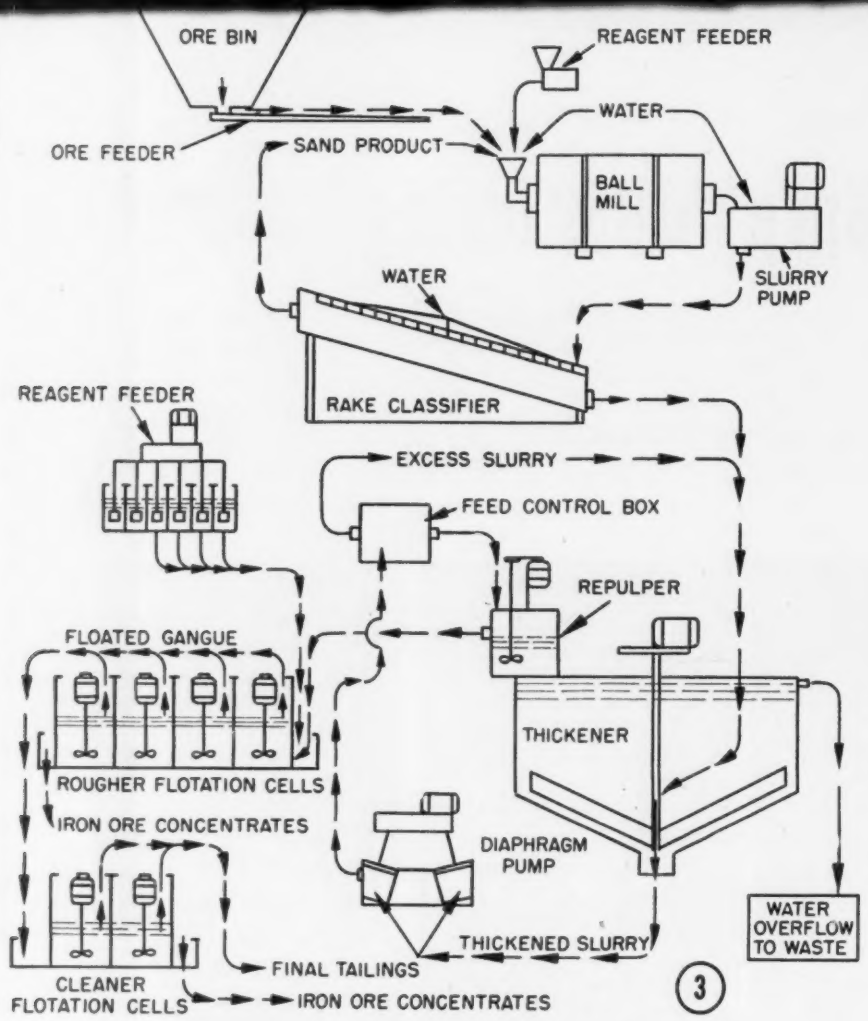


Fig. 3—Flow sheet of pilot plant flotation circuit

Fig. 4—Drill core as it comes from the rock drill at bottom. Split sections for closer examination at top

of iron content.

Taconite ore bodies, found in vast quantities in the Lake Superior region, are first explored with core drills. A series of cores from test holes, in proper sequence, provide a complete picture of the types of rock in a given location. To develop reliable data, each core must be carefully labeled as to location and depth.

When received at the laboratory a core sample is split lengthwise. Half is stored for future reference and the other half started on a series of microscopic, petrographic, mineralological and chemical tests to determine whether the iron content can be unlocked easily enough for industrial use. If it is decided crushing and grinding will reduce the rock to a mixture of iron and waste materials within economical limits, a batch laboratory then undertakes tests to develop the best method for separating out the iron.

Since the iron particles in taconite may be either highly or weakly magnetic, the two most common types of separation considered are magnetic separation and froth flotation.

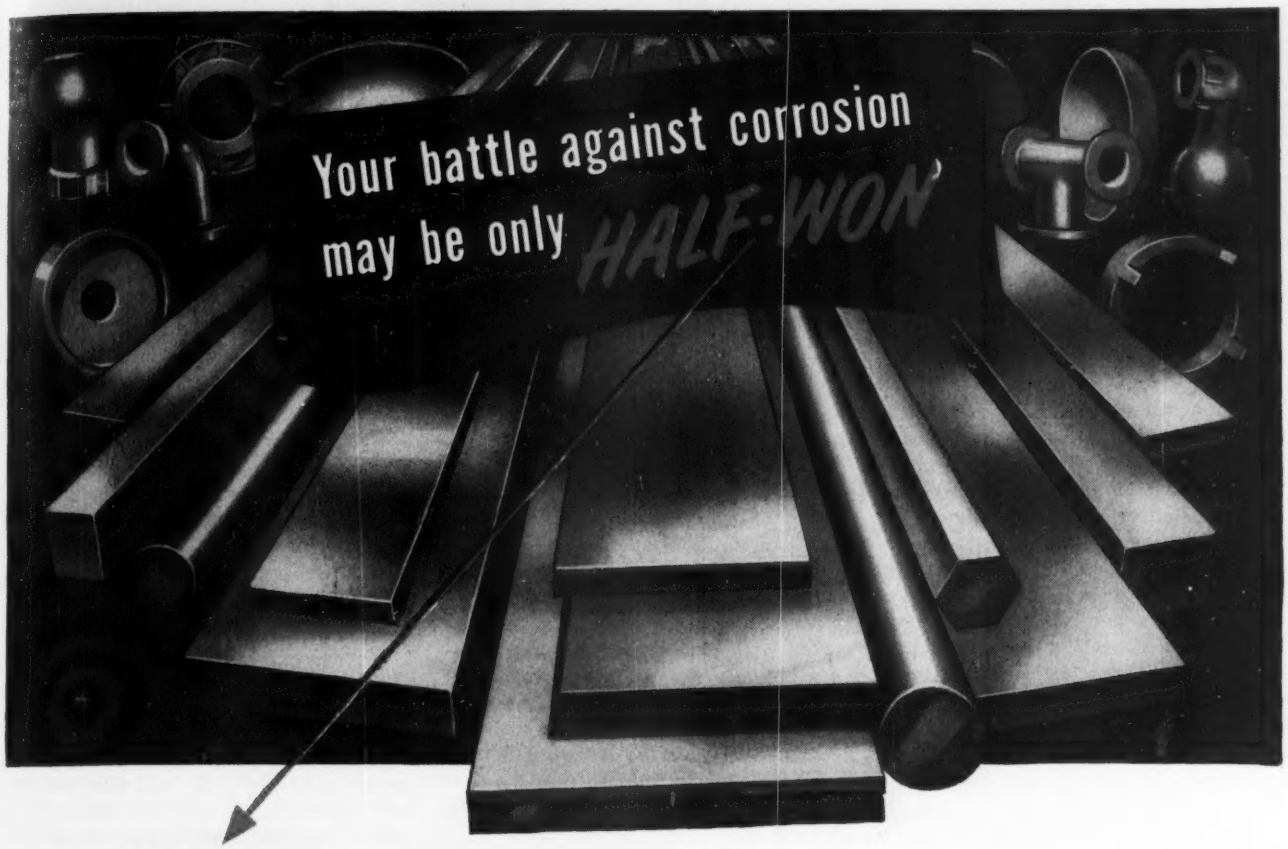
The laboratory building of brick and reinforced concrete has a total floor space of approximately 58,450 square feet. In addition to a batch-testing laboratory and a pilot-plant test area, the building has completely equipped rooms for chemical analysis, microscopy, petrography and specimen preparation. An extensive technical library, conference room, sample and equipment storage areas, offices, shower room, and an integral garage are also included. Service facilities include an automatic passenger elevator and a freight elevator of 7-ton capacity.

All working areas are piped for gas, compressed air, vacuum, and hot and cold water supply. Similarly, bus ducts that can be tapped anywhere make it possible to connect electrically-operated machinery to 110, 220, or 440-volt power lines as required.

Features Flexible Arrangement

A special feature of the pilot-plant area and the batch-testing laboratory is a flexible arrangement for setting up experimental flow-sheets for concentrating iron ores. This embraces an area surrounded by bracketed steel uprights which, in combination with steel cross members and subway grating, permit installation of test equipment at various working levels. This principle for constructing flow-sheets is extensively applied in the pilot-plant area, which can handle outputs up to 1 ton per hour, while the smaller area in the batch-testing laboratory is limited to 100 pounds per hour output. This special method of construction, which is somewhat like that embodied in a boy's construction set, makes it possible to assemble, alter or tear down a flow-sheet in relatively short time. Considerable space is thus saved, which would otherwise be uneconomically occupied by numerous permanent installations of varying basic types of flow-sheets that would be used only as occasion demanded.

Microscopic study of ore specimens at each stage of processing establishes the feasibility of separating the different mineral particles by mechanical crushing and grinding. Data from these examinations determine whether or not the batch-testing laboratory will carry out magnetic separations, flotation tests, and so on. If the decision is favorable and the batch tests show promising results, a flow-sheet is set up in the pilot-plant area, and large-scale samples are processed to establish



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In addition to all standard analyses of stainless and acid resisting steels, JESSOP also produces Types such as 309S, 309SCb, 316Cb, 317, and 330, which are not generally available. The JESSOP Service Engineers will gladly work with your fabricator to help you make the best use of stainless steel in your equipment.

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WASHINGTON, PENNSYLVANIA

preferred procedures and determine the best beneficiating method for the particular ore under study.

Operations then will be transferred to a pilot plant at the ore site, and eventually lead to full-scale operations at the site.

The pilot-plant test area extends the equivalent of two and a half floors from a well in the basement through an opening in the first floor to the first floor ceiling. This provides a vertical space 27 feet in clear height, 60 feet wide, and 22 feet long.

A machine shop complete with metal-working machinery and welding equipment, a wood-working shop, pulverizing and grinding equipment, and the shower room are located on the first floor. The second floor houses the batch-testing laboratory, chemical laboratory, administrative offices, conference room, and library. Located on the third floor are the microscopic laboratory and a storage area for samples. This latter area will be converted later for experiments dealing with preparation of ore concentrates for use in the blast furnace.

The fourth floor is laid out systematically for storage of testing equipment between periods of use in experimental ore concentration arrangements called "flow-sheets" by the industry. A definite location has been marked and numbered on the floor for each piece of equipment which bears the same number; thus units are returned always to the same location after use. This facilitates good housekeeping and makes possible the rapid location and handling of any unit required for a particular test run.

Individual phases of ore concentration problems are studied in the new batch-testing laboratory. Batches of representative samples weighing between 1 and 100 pounds can be handled here. Individual tests are carried out in bench-mounted equipment, or in small floor models of larger industrial units. Such tests include determination of size fractions of crushed and ground material, magnetic separation, froth flotation, and so on.

Chemical Analysis Necessary

Chemical analysis of ore samples is necessary at various steps in the study of concentration processes. If, for example, chemical analysis demonstrates that an undesirably large amount of silica is still locked up with the iron oxide in a taconite after crushing, grinding and concentration, the sample provides a basis for deciding that taconite of this type is unsuitable for present consideration as a desirable source of material for producing concentrates containing high percentages of iron oxide.

Preparation of samples for analysis is simplified by mechanical aids such as the mechanical pulverizers, which duplicate the effect of the tedious manual effort required when grinding a sample in an ordinary mortar with a pestle.

The chemical laboratory is completely equipped with every type of analytical apparatus and reagent required for the highly specialized work it handles, in addition to regular equipment for routine work of a more general nature. This includes an electrically-heated drying oven, batch-type electric furnace, and a tube-type electric furnace. These latter units are all automatically controlled.

The microscopic laboratory is equipped with a series of microscopes of modern types for the examination of prepared mineralogical specimens. Any of these microscopes can be equipped with camera attachments for recording interesting phenomena discovered by visual observation. Included in the equipment of this department is a metallographic microscope of latest design.

A large, completely equipped darkroom has been provided for photographic processing.

Preparation of samples for microscopic examination involves the use of a 50-ton capacity hydraulic press for mounting the specimens in plastic, a diamond saw for preparing a flat face on specimens before mounting, cast-iron laps for rough polishing of mounted specimens, and an automatic final polishing machine for simultaneously finishing six individual mounted specimens on a lead lap.

Large-scale ore samples are delivered to the storage yard adjoining the laboratory in railroad cars. Samples from outdoor storage are dumped into a skip-hoist conveyor that carries them to a primary jaw crusher in the basement of the building. Other crushing and screening equipment in the basement is used for preparation of samples prior to introducing them to concentration processes.

Arc Welding

(*Concluded from Page* 102)

trode over four times as large would be required for same amount of current in conventional welding. Currents used concentrate heat sufficient to weld ¾-inch plate in a plain butt joint making one pass on each side without edge preparation.

Increased Output—In welding a scroll shaped casing for a collector, as shown in Fig. 3, operator output has been stepped up 50 per cent since only three passes with a machine setting of 375 amperes and a speed of 14 inches per minute are needed compared to five passes at a rate one-fifth as fast required previously. Another advantage of hidden arc welding is the ability of the operator to work in relative comfort in close quarters, Fig. 2, because of the absence of smoke, spatter and visible arc rays.

For joining bottom circular section of collector, Fig. 1, welder is used in conjunction with a power driven positioner. A 45-degree bevel is flame cut on edge of circular side piece to make a single bevel joint with flat end piece. After a sealer bead is put in, two passes are run at a speed of 14 inches per minute and a machine setting of 500 amperes. One pass is then put on inside. Welding of cone elements for collectors requires preparation similar to that used for circular sections. During the welding operation, however, power drive is not required since welding is done in a straight line.

Additional uses for manual hidden arc unit include: Welding inside joints of heads in making closed tanks, welding inside longitudinal seams of small pipe by putting gun on an extension and making long straight seams by clamping gun to buggy of a radiagraph machine. On all jobs a large proportion of flux deposited can be recovered and used again with screening and other normal precautions to insure cleanliness.

Automatic Generator Supplies Furnace Gases

Furnace gases for use as atmospheres for bright annealing, copper brazing, gas carburizing and various other processes can be produced with an automatic endothermic generator recently developed by Ipsen Industries Inc., Rockford, Ill. Once proportioning is set, generator is completely automatic and produces only the volume of gas required.

In producing the gas, air and raw gas are drawn through flow meters, accurately proportioned and pumped through a fire check into the externally heated and catalytic cracking retort.

Drives Backup Rolls on

New 4-High Cold Strip Mill

Output of experimental unit is three to ten times greater than that of a duplicate all-pull mill. Reductions range from 35 to 50 per cent per pass depending on whether alloy or low-carbon steels are being rolled. Larger all-purpose mill for general production to be built

ART of rolling and annealing steel was explained and discussed at length at the annual spring conference of the Association of Iron and Steel Engineers, Hotel Statler, Buffalo, April 26-27—the first national meeting to be held in that city since the formation of the Buffalo section. Attendance exceeded 640. R. A. Gillies, vice president, Steel Co. of Canada, Hamilton, Ont., spoke on economic conditions in Canada at the dinner Monday evening. Tuesday afternoon was devoted to an inspection trip at the Lackawanna plant of the Bethelehem Steel Co.

A digest of various papers presented at the 2-day sessions follows:

L. L. Wilson, engineering consultant, Cold Metal Products Co., Youngstown, O. described the new 10-inch 4-high reversing cold strip mill of his company which has been in operation for over a year. The mill which serves as a finishing mill for razor blades, stainless and silicon steels is a result of the company's endeavor to overcome the drive deficiency, strip breakage and other disadvantages of the all-pull type Steckel mill and to overcome certain deficiencies of the large wholly or partly driven work roll type of 4-high mills.

The new mill has work rolls 3 inches diameter, backup rolls 4 inches diameter, and a roll face of 10 inches. Rollable strip width is 9 inches. Power is supplied by 50-horsepower motors driving each backup roll and also 50-horsepower motors on each tension reel.

Many experiments were conducted using 18-8 stainless, 3.3 per cent silicon steel and 1.25 per cent carbon steel. Reductions approaching those usually considered normal with low-carbon steel could be made on these materials. Over 35 per cent reduction per pass have been made on the soft stainless, silicon and carbon steels and over 50 per cent on low carbon, and at no time did slippage occur.

The 3-inch diameter work roll was adopted because the 1¾-inch rolls required too frequent regrinding. Also the smaller rolls would not hold their shape under the heat generated by heavy reductions.

Production on this experimental mill is from three to ten times that obtained from an almost duplicate all-pull Steckel mill in the same plant. Higher production rates are obtained when rolling silicon, high-carbon and alloy steels and particularly in the lighter gages. Breakage and consequent delays have been greatly reduced. Indicative of the reductions which may be accomplished, it was found that when rolling low-carbon from 0.020 to 0.006-inch, this reduction could be accomplished in three passes. When rolling 3.3 per cent silicon steel from 0.025 to 0.010-inch, three passes also were employed.

Plans are being formulated, stated the speaker, to build a larger mill to be used as an all-purpose mill for general production. It will have 6-inch work rolls and 34½-inch backing rolls. Maximum speed will be 1800 feet per minute and rolling width 26 inches. Reels will take coils up to 400 pounds per inch width and up to 53 inches diameter.

As planned, this mill appears suited to the intermediate reductions as for rolling to final gage. It will do as well as any for the breakdown passes and, according to the speaker, is completely flexible in its application for heavy, medium or light-gage work on all types of material. Thus it may be used as a breakdown mill or a finishing mill or both.

J. S. Apperson III, application engineer, General Electric Co., Cleveland, in discussing the electrical equipment for the new-type cold metal process mill asserted that from observations during a number of heavy passes the MD-type motors operated at over 200 per cent load without stress. However, he did not recommended this type motor for reversing mills where motor field must be weakened.

Power curves show that it takes about 30 per cent more power to roll high-carbon or razor blade steel than it takes to roll mild steel. The speaker anticipated it will require about 75 per cent more power to roll 18-8 stainless than is required for rolling low-carbon steel.

He cautioned that power curves should not be used to select motors for rolling high silicon and stainless steels. Annealing and work hardening play such an important part in determining the required power that considerable attention must be paid to the starting thickness and the extent of the reduction.

The proposed mill will have each backup roll driven by a 500-horsepower double-armature motor, 70/210 revolutions per minute.

In conclusion Mr. Apperson stated that no observable slippage or marking of the strip had occurred when the relative currents in the individual roll drives were offset about 15 per cent while the mill was rolling a normal schedule. Evidence that individual roll drives on cold mills are practical was furnished from a test experiment on the world's fastest tandem cold strip mill. Work rolls having a ¼-inch difference in diameter were installed on the last stand and while rolling tin plate at a speed of 4800 feet a minute, no strip marking or chatter was observed.

W. J. Barry, superintendent of

mills, Bethlehem Steel Co., Lebanon, Pa., in describing looping and repeating on merchant mills, presented a detailed description of how hand looping was replaced by completely mechanized repeating on a 10-inch mill at the Lebanon plant. This mill is said to be the first to be equipped to repeat rounds, squares and nut bar flats through all roll stands.

He explained the first repeater was placed 21 feet away from No. 5 stand. The bar was run through a 4-inch trough, 17 feet long, which is covered for about 14 feet, and through an open trough and horn trough to the repeater, a distance of 7 feet. This gave the bar ample distance to lift out of the repeater groove, or gutter. He warned that if repeaters are set too close to the rolls or twist guides, the bar is held down and is not free to loop out. Other repeaters for Nos. 10 to 12 stands were mounted 10 feet from the centerline of the rolls.

To facilitate getting the bar to turn up properly to enter the next pass especially the finishing oval or diamond, or flat and edge passes, a pair of twister guides were installed on the delivery side of the pass, 2½ feet from centerline of rolls. These are adjustable by set screw so that the twist of the bar can be changed without shutting down the mill. Guide setting is at least 3/31-inch clearance between the bar and guides. The twist guide is set at approximately 17 degrees between Nos. 9 and 10 stands.

To prevent double kick, a kickout lever was installed. When the bar enters the receiving set of rolls the entry guide closes on it, while at the same time the kicker arm comes up and raises the bar out of the repeater groove and holds it out until the last end has passed through the receiving set of rolls. The kickout lever also serves another purpose in that the roller can get a test piece by kicking the bar out of the repeater before it enters the next pass, or if there is a wreck on the mill, the bar can be raised out of the repeater at the most convenient place.

To change the entry guides on a round is like changing the pass; it takes several trial pieces before the section can start agin. To overcome this, the speaker stated, nickel-chrome steel guides are used. Entry guides made of this alloy give a campaign of 2500 tons, or about 50 times as long as old type chilled-iron guide.

In rolling ⅞-inch rounds and putting a 1600-pound billet through the rolls every 52 seconds, the roller was able to keep the section within gage at this rate by using fiber bearings. Brass babbitt grid bearings and fiber bearings gave the following service:

Brass bearings averaged 4400 tons

1 fiber bearing is equivalent to 112 brass bearings

1/64-inch wear on a fabric bearing is equal to 2½ brass bearings

Average tonnage for 12 fiber bearings for each 1/64-inch wear was 11,347 net tons.

Mechanical repeating with other improvements raised the output from 16 tons an hour with hand-looping in 1926, to an average of 27 tons an hour for 1947, an increase over hand-looping of 69 per cent for all grades of bars. The yield for 1947 was 96.56 per cent for all grades.

C. R. Hammond, rolling mill superintendent, Atlas Steels Ltd., Welland, Ont., in discussing the rolling of flats, declared that to overcome collaring when using tongue and groove rolls for flats, it is necessary to keep the amount of stock entering the first tongue and groove pass to a minimum, keeping in mind the width required to produce corners on the finished bar. Once the stock increases to the extent of crowding the tongue and groove pass, a large amount of pressure is exerted on the guide in the grooved roll. It therefore is necessary for the roller to maintain the proper amount of stock in the first tongue and groove pass, and all other passes, to eliminate guide breakage and collaring.

In rolling a 0.500 x 0.375-inch section, the edging groove could be 0.395-inch and the section entering the edging groove should be 0.540 x 0.395-inch. This, the speaker explained, will produce a section in almost any desired hot bed length with a minimum of variation from the front to back end. The roller should know to the thousandths, he cautioned, the width of the edging groove he is using and maintain the thickness of the section the same as the width of edging to produce a square and uniform section. A section 0.005-inch greater in width than the edging groove, will cause poor corners and also wear the edging groove wide. A section 0.005-inch less than the width of the edging groove will cause the section to run slightly off square.

The step-and-edge method of rolling flats generally is used where alloy grades are produced. The advantages are flexibility, good surface and section, combined with economical roll cost for the number of sections that can be produced.

Stainless grades vary in regard to spread making it necessary for the roller to compensate for the spread by less stock and less reduction, always maintaining the flats entering the edging to the dimension of the edging groove. Because of the natural increase of spread and flow of the material, corners are not usually difficult to obtain and therefore less stock and draught in the edging grooves is required. This, the speaker emphasized, is also desirable to assist in eliminating wrinkles, or mechanical seams, collar marks and shearing, the latter causing slivers.

Water on high-speed grades is not desirable, Mr. Hammond contended, particularly on flats, because cold rolls chill the corners of the bar and add to the problem of checking. Large quantities usually are not involved and bars are usually short and therefore the roll contact time is short and the heat is dissipated at a reasonable rate. On large quantities, however, and at a rapid rolling rate, water can be used on the groove if packing is employed to prevent it being carried around the roll and on to the bar.

To facilitate quick changes, the guide assembly for the step and edge method should be designed so that entry box can be moved easily from one groove to the other. The rest bar should be placed on the outside of the roll housing with adjusting screws to assist in raising and lowering the rest in a minimum of time. The speaker stressed the importance of this because several widths are attained from one edging groove and therefore rapid changes and adjustments reduce the downtime of the mill.

J. D. Keller, Associate Engineers, Pittsburgh, in speaking on "Heat Transmission in Strip-Coil Annealing", made it plain that portable annealing furnaces are ideal for annealing sheets in piles since the thermal conductivity of these is excellent for heat flow in the horizontal direction, or from the sides of the pile. He pointed out it is equal to that of solid steel and averages about 25 Btu per square foot, per hour, per degree Fahr., per foot of thickness. With coils, however, placed with axis vertical, for flow of heat in the radial or perpendicular to the layers of wraps of the strip, the conductivity is only about 1¼ Btu per square foot, per hour, per degree Fahr., per foot of thickness, or not much greater than firebrick. Moreover, the thermal diffusivity, which is the factor that governs the equalization

of temperature throughout the coil is only about one-half as great as that of firebrick.

Development of convector spacers with powerful fans to circulate the atmosphere gas through them, has received considerable acceptance in the past two years. Convector spacers are placed between the coils in each stock and transmit heat to the coil ends. Test data show that when properly applied such fans and convectors decrease the required heating and cooling time by at least one-third, and correspondingly increase the output at least 50 per cent.

Once the possibility of a radical departure from present practice is conceded, the author asserted, many possible lines of development present themselves. One possibility is that of handling coils as at present, but forcing either hydrogen or helium through the crevices between the layers. Thus it should be possible to reduce the heating and cooling time to not over 45 per cent of that required at present for 44-inch outside diameter coils. Output would be about 2¼ times the present figures, and would be the greater in proportion, the larger the coil.

Another possibility pointed out by Mr. Keller is that of developing the heat directly within the hollow spacers between the coils and the cooling by controlled water-spray injection. Still another suggested improvement involves passing the coils continuously, with their axes horizontal, through a tunnel furnace having a protective gas atmosphere.

C. E. Peck, manager of industrial heating engineering, Westinghouse Electric Corp., Meadville, Pa., in discussing various types of atmospheres now being commercially applied to the annealing of a wide variety of steels pointed out that excluding the stainless steel groups, the two elements in furnace atmosphere which will discolor steel are water vapor and small amounts of molecular oxygen.

Since high-carbon and alloy carbon steels must be annealed in the critical range or a little above and held in these ranges for many hours, the controlled atmosphere must be practically neutral to prevent any loss of carbon from high-carbon steels or any gain of carbon in medium carbon alloy steels. Completely burned fuel gas set for 3 to 4 per cent CO and about the same amount of H_2 has been found suitable for long cycle annealing of high-carbon steels without oxidation or decarburization.

Tool steels and alloy carbon bar stock usually require higher anneal-

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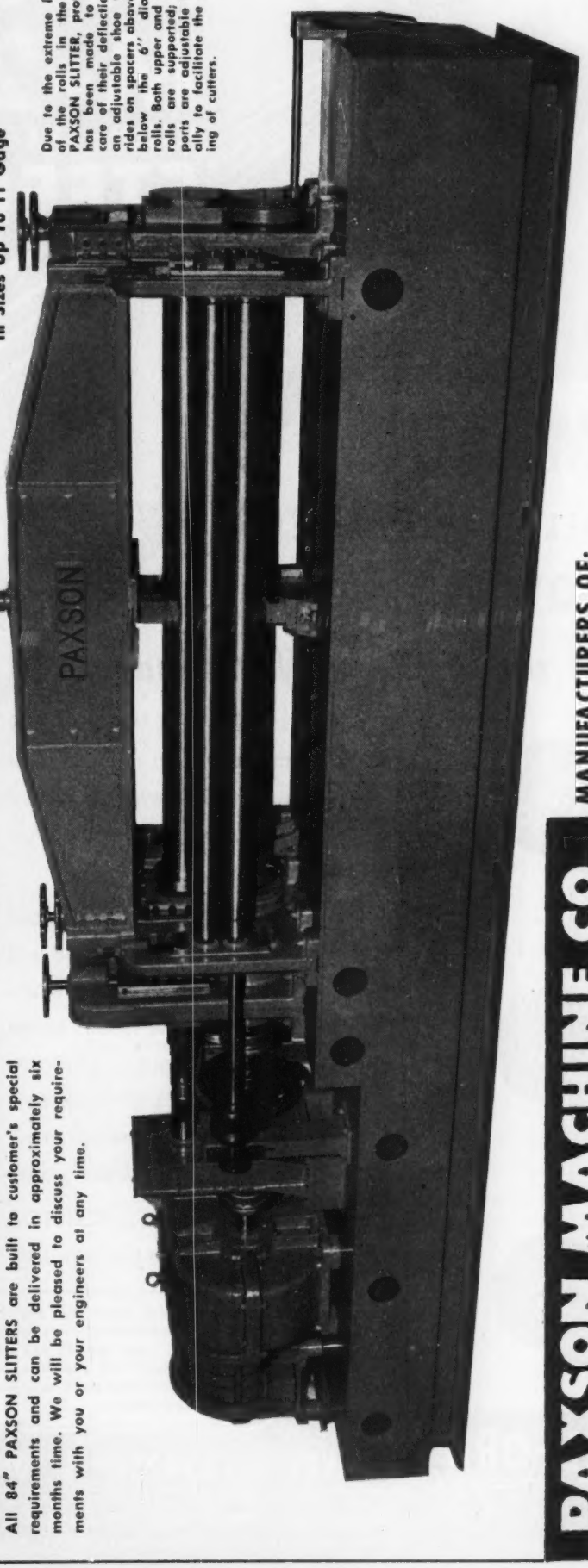

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ing temperature than straight carbon strip, rod and wire. Since possible reaction rates of the controlled atmosphere with the steel surface are much faster at these higher temperatures, it is important to use an atmosphere which is chemically stable within itself and which is about neutral on the steel so that no decarburization occurs. A completely burned fuel gas with CO_2 and H_2O removed with a setting to give around 4 per cent CO and about 5 to 6 per cent hydrogen will allow annealing without additional oxidation.

The speaker attached importance to the pressure actually existing under the annealing cover. To insure against back diffusion through the seal due to any small leaks in the cover, the pressure under the cover, he emphasized, should be greater than any possible chimney action. The necessary pressure is a function of the height of the inner cover. A safe rule to follow to prevent inward leakage is 0.1-inch water column per foot of height of inner cover. This means at least 0.5-inch water pressure beneath the inner cover.

The idealized atmosphere for a wide range of steel annealing application mentioned by the speaker would meet the following requirements:

1. Low in cost
2. Generated from readily available fuel gases.
3. Relatively inert, no combustion hazard.
4. Nonoxidizing
5. Nondecarburizing
6. Chemically active enough to overcome oxygen impurities but inert enough with slow enough reaction rates to eliminate soothing and etching throughout the entire annealing temperature range.

A completely burned fuel gas with CO_2 and H_2O removed but with a ratio of fuel to air adjusted to give 3 to 4 per cent CO and corresponding hydrogen content, comes close to fulfilling all foregoing requirements.

E. M. Anger, chief metallurgist, Duraloy Co., Scottdale, Pa., in describing methods followed in the manufacture of centrifugal tubular castings for industry, directed attention to the fact that centrifugal production of alloys in tubular sections in the past few years has developed to an extent where nearly any section can be quickly produced from most alloys.

During the war a large number of copper driving bands for shells were cast centrifugally in short lengths in washed chilled molds in 14 and 16 inch diameters. The wash was

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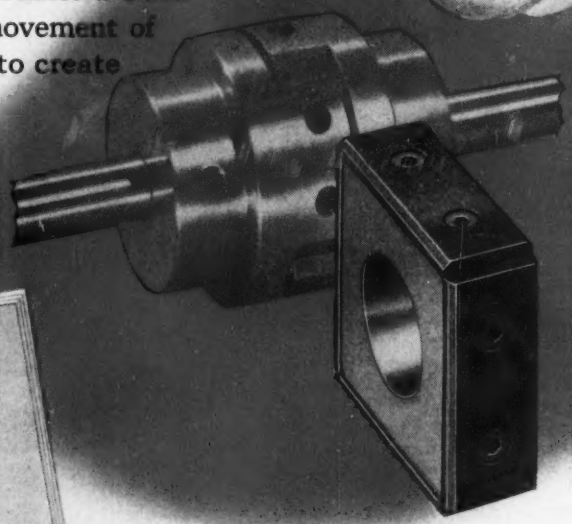

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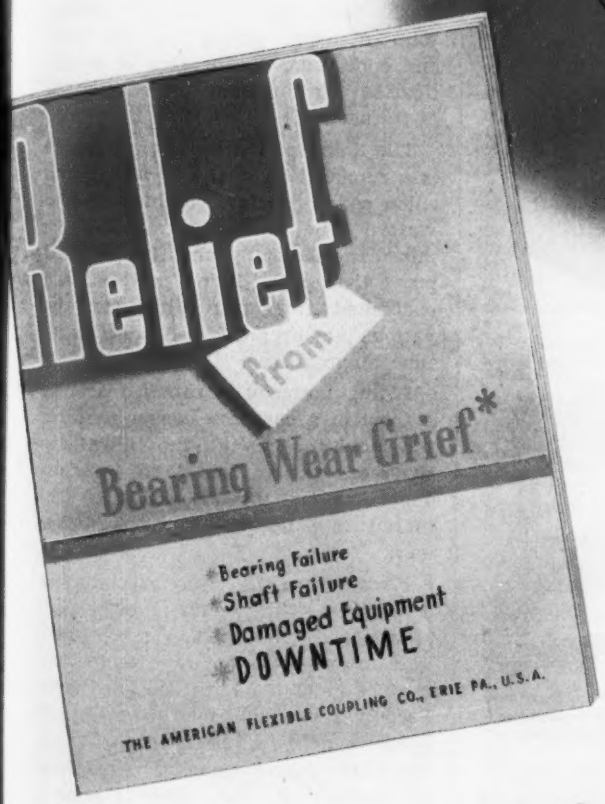

This booklet reveals how abnormal bearing wear, creating Bearing Wear Grief, eventually and inevitably results in damaged equipment and downtime. It presents practical help for the relief of Bearing Wear Grief. We believe design engineers will achieve a greater insight into the true functions of flexible couplings. Plant engineers, master mechanics, and maintenance men will definitely benefit, because herein are answers to many questions—what causes Bearing Wear Grief—bearing failure, shaft failure, damaged equipment, DOWNTIME. Write for your copy on business letterhead.

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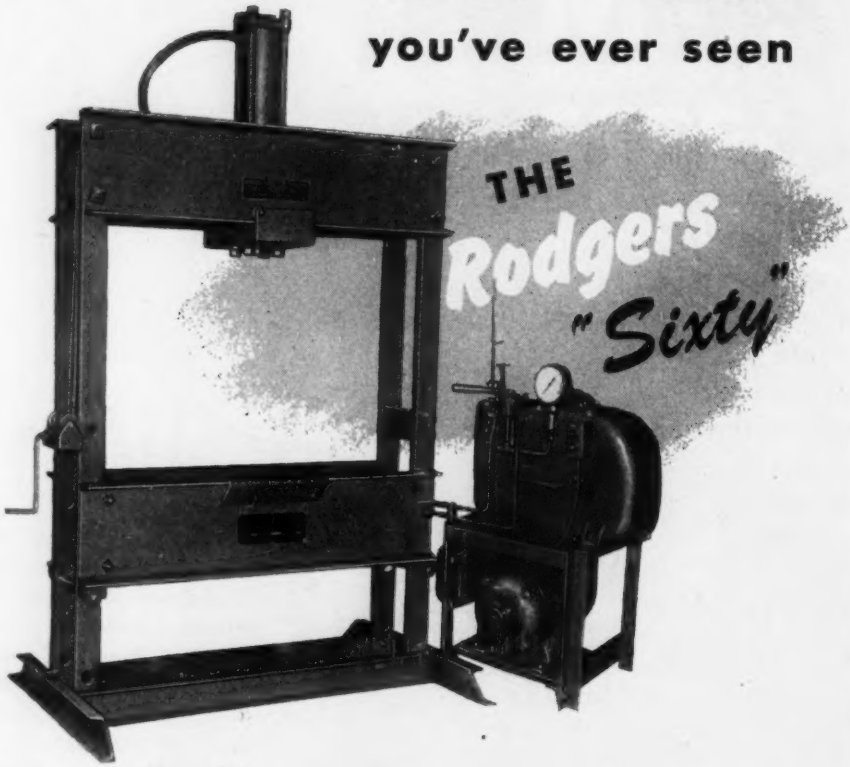

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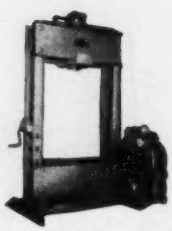
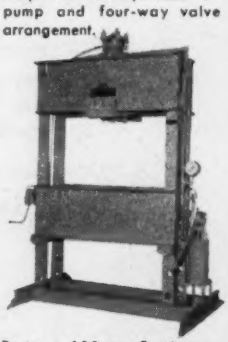


Rodgers 150 ton Stationary Shop Press with hydraulic "D" pump and four-way valve arrangement.



Rodgers 100 ton Stationary Shop Press with 4-speed, hand-operated hydraulic pump.

Send today for your copy of the "Rodgers Hydraulic Shop Presses" catalog. It gives complete descriptions, illustrations and specifications of the various models.

Rodgers Hydraulic, Inc.

HYDRAULIC POWER EQUIPMENT

Shop Presses

Crawler-Track Presses

7423 Walker St., St. Louis Park, Minneapolis 16, Minn.

Power Pump Units

Portable Presses

a silica wash similar to that used at present in centrifugal casting.

Tubes are being made up to 17 feet long and up to 20 inches diameter and shorter lengths to much larger diameters.

Centrifugal casting can be defined as a process by which fluid pressures stimulate solidification and the effect caused by the centrifugal force is dependent upon the mold speed and the density of the metal.

When a molten metal and alloy solidifies it follows columnar crystallization principles closely when only atmospheric pressure or relatively little motion is present.

If both pressure and motion are present each particle of a liquid whether in solid solution or complex alloy, in solidifying, breaks up into two parts, slightly different in composition and fusibility. The one part solidifies because it is infusible at the existing temperature and attaches itself to the previously solidified enclosing walls, and the balance is fusible at the existing temperature until more heat is dissipated and then solidifying under pressure on the walls.

This process of solidification continues with the help of pressure and motion causing the liquid layer to wash over the previously formed solid material giving up its heat and continuing the process of solidification by diffusion or convection of its heat.

The lining of the centrifugal molds is a composition of the highest grade silica sand, fireclay, corebinders and water. The ramming material is mixed mechanically and the physical properties of the lining material are controlled to specification for the various requirements of centrifugal tube manufacture.

Lining material is rammed around a form in a cast-iron casing to form the mold for casting the tubes. Its thickness varies from 1 to 4 inches depending on the size of tube required and the size casting being used.

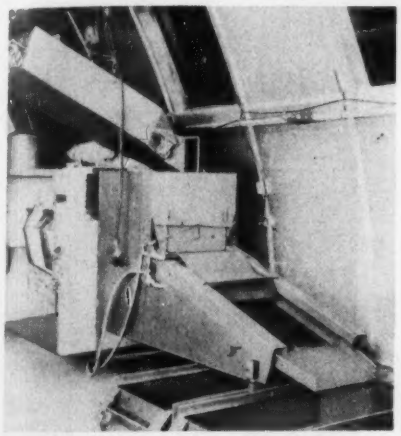
Hardness of the rammed mold is around 90 with a dry compression strength of 250 pounds per square inch after processing at 450 degrees F. The mold casing is equipped with head plates which must be fastened securely and remain in place while the pouring and spinning operations are carried on. The metal is poured through a runner box with a nozzle leading into the spinning mold. Molds are rotated until the tube temperature has dropped low enough to allow the machine to be stopped without injury to the tube casing.

New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 134

1. Stationary Separator

Parts are separated from abrasive chips and the chips are screened to size by the stationary separator, manufactured by Mecha-Finish Corp., Sturgis, Mich., to follow mechanical finishing machines in the finishing room. A hoist pan full of parts and

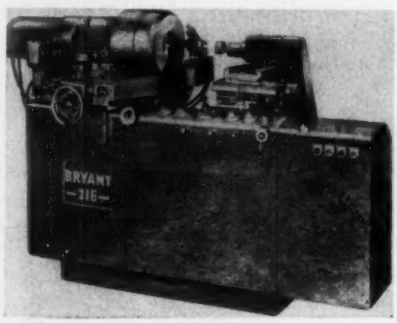


abrasive chips, after mechanical finishing, is loaded into the hopper of the separator.

With proper screens, the abrasive chips are deposited in a hoist pan under the unit and the parts in a pan or container at the end of the machine. Variable speed is provided for screen oscillation and control of the screen agitator. Flushing facilities are incorporated to wash the parts and abrasive chips from above and below the screen.

2. Internal Grinder

Suited for grinding work with bores up to 8 inches in diameter and lengths up to 6 inches, the No. 216 high production automatic internal grinder, announced by Bryant Chuck-

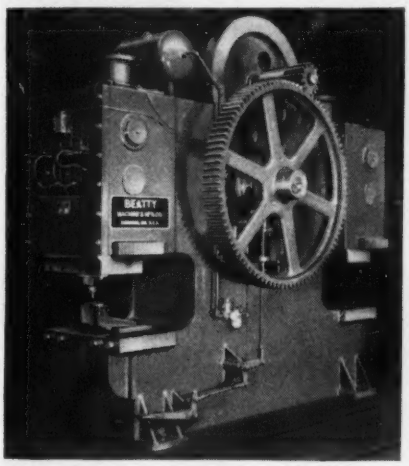


ing Grinder Co., Springfield, Vt., has a 16-inch swing and a 15-inch total wheel slide traverse. For the smaller ranges of bores high frequency wheel spindles operating up to 100,000 revolutions per minute may be used.

Cylindrical slide construction of machine provides maximum rigidity. Wheel slide is supported at three points, each with pressure lubrication. Cross feed is obtained by lateral motion of work table. The various movements of the machine are hydraulically operated. Cycle control is accomplished electrically. Three methods of automatic sizing are provided for the machine.

3. Double End Punch

In addition to shortening the distance from punching centers from the previous 12 feet down to a new 9 feet, the No. 9 double end punch,



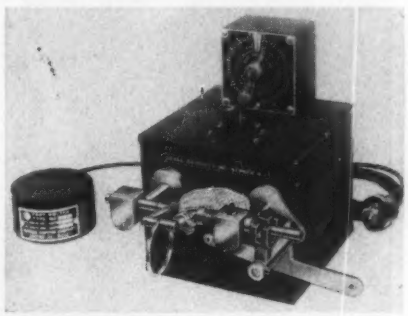
announced by Beatty Machine & Mfg. Co., Hammond, Ind., employs welded steel construction instead of the former cast construction. The shortened machine is more rigid, occupies less floor space and better fits production line requirements.

Features include centralized lubrication and air counterbalance or ram. The machine has a 24-inch throat at each end and an architectural table with front filler block to convert to plain table.

4. Soldering Machine

Production soldering of small products, instruments, etc., is simplified by the soldering machine for hard and soft soldering jobs, manufactured by Joyal Products Inc., 12 Grafton Ave., Newark, N. J. Another use is annealing and hardening small parts. Interchangeable special electrodes are designed for each job.

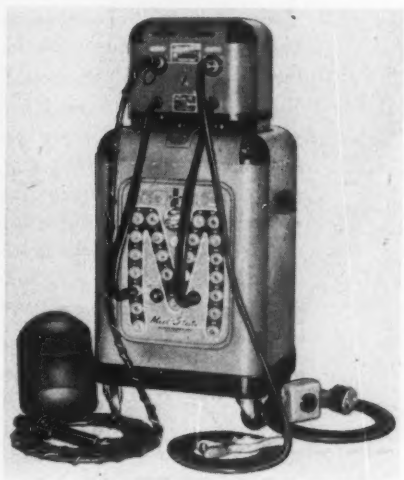
Operation of electrodes is spring-action controlled so that when electrode arms are closed, work is held firmly in position for soldering and cooling. Machine can be used either



vertically or horizontally. An automatic cut-off timer regulates soldering time. Its heat control has six adjustments. Operation is by foot switch. Soldering time averages less than 1 second.

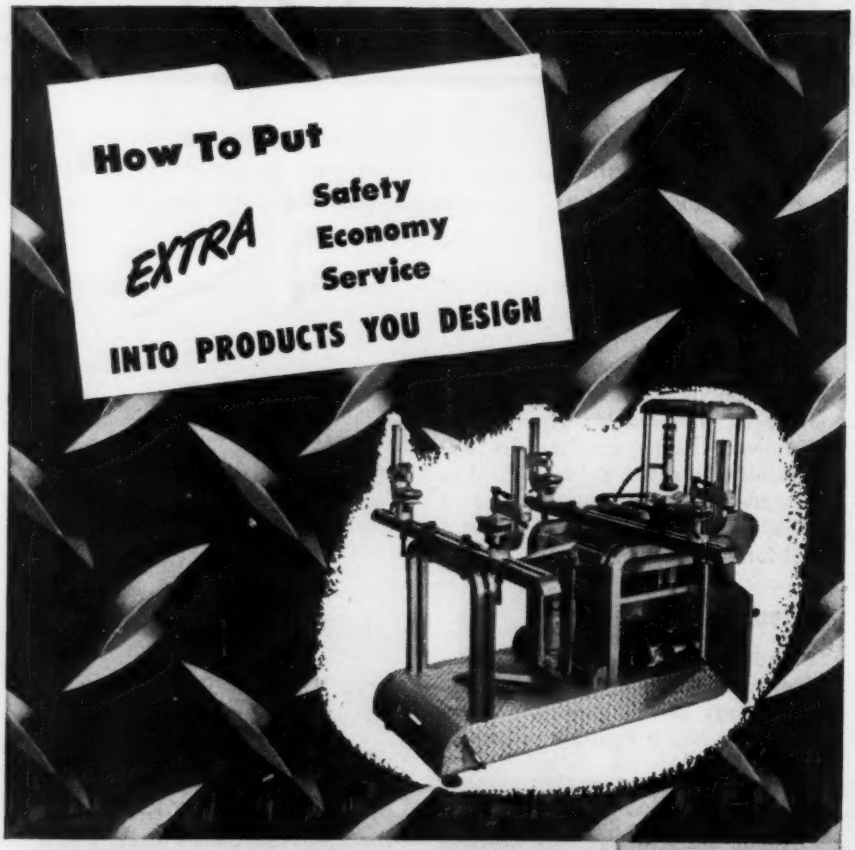
5. AC Arc Welder

Featuring a precision electrical circuit which holds the welding arc constant with selective heat settings



in one ampere steps, the two new high cycle alternating current arc welders, announced by Mid-States Equipment Corp., 2429 South Michigan Ave., Chicago 16, Ill., have 200 and 300 ampere output, respectively. Transformers of the welders are of the air cooled induction type.

High frequency circuit with remote feather touch control at the electrode holder is usable for electronic flux-



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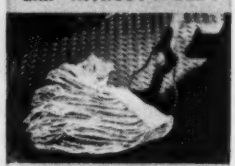
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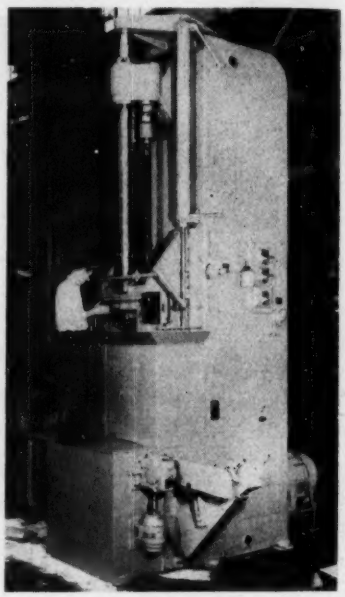
ing and oxide dispersal requirements of the new arc processes such as the inert gas shielded arc welding and Heliarc process. Neither unit has any moving parts.

6. Vertical Broach

Normal operating capacity of 30 tons and a broaching stroke of 60 inches are claimed for the vertical pull-up internal hydraulic broaching machine announced by American



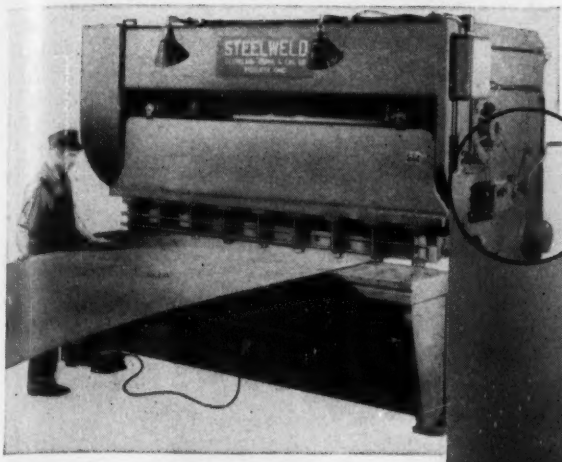
Broach & Machine Co., Ann Arbor, Mich. Machine was designed to broach involute splines in gear blanks. Operation of machine is by use of push-button controls and all operating cycles are electrically interlocked.

Features include: Helix lead and nut bar for driving broaches during pulling stroke; lower guide which not only raises the broaches up to pull heads but also continues up, providing additional alignment; and a chip conveyor for removing excess chips from coolant reservoir. One complete cycle produces two parts. They are unloaded when broach is at top portion of cycle. Operator's platform is at floor level.

7. Presses

Improvements in the line of Press-Rite presses, manufactured by Sales Service Machine Tool Co., St. Paul, Minn., include use of antifriction roller bearings in the flywheels (except in No. 0 model), single stroke clutch, a clutch dog which engages into a 4-point steel ring attached to the flywheel hub and a special cam actuated automatic brake. Included in the improved line is a new model No. 12 twelve-ton press.

Automatic brake need not be ad-



THE *Right* KNIFE CLEARANCE FOR EVERY PLATE THICKNESS

ONLY STEELWELD SHEARS HAVE THIS SIMPLE KNIFE ADJUSTMENT

It is simple, fast and easy to adjust the knife clearance on a Steelweld Pivoted-Blade Shear to suit every plate thickness. No bolts to loosen! No bed to move! No feeler gauges required!

Only turn a crank and watch a dial. That's all there is to it. The large easily-read dial indicates the clearance between knives in thousandths of an inch and also shows the plate thickness that may be cut with any knife setting. Because of the ease with which knife adjustments are made, every cut made on Steelweld Shears is the best cut possible—straight, smooth, accurate. And of importance, knives remain sharper for longer periods.

Steelweld Shears are built for thicknesses of 12 gauge to 1¼ inch and for lengths of 6 to 18 feet.

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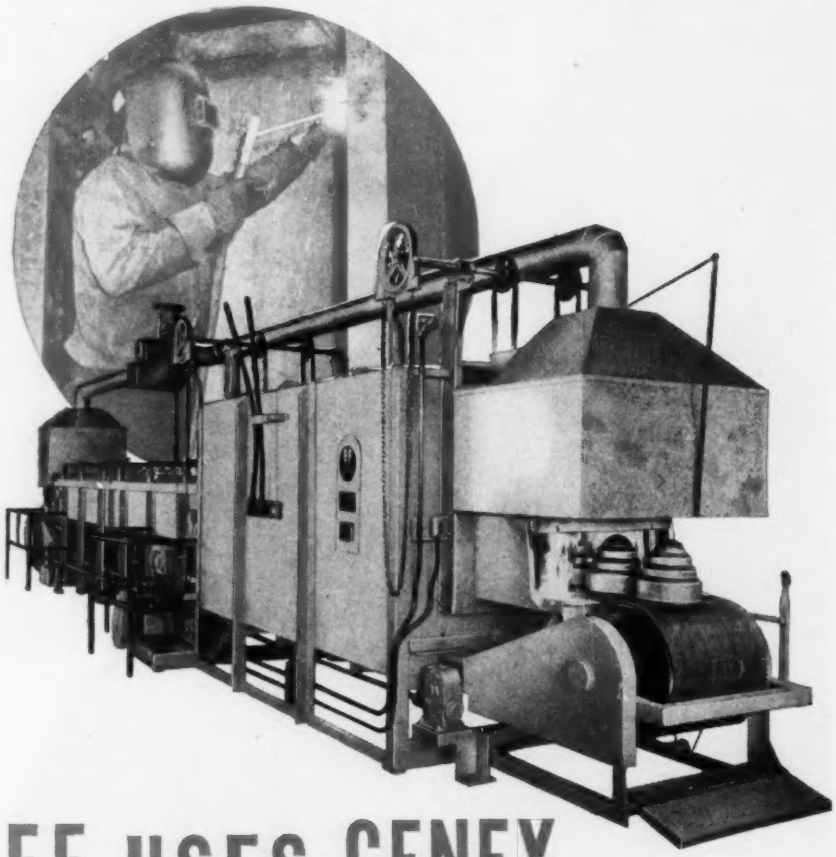
For GAS TIGHT WELDS at HIGH SPEEDS...



EF USES GENEX

WELDS in the heating and cooling chambers of special atmosphere electric furnaces must be gas tight to prevent infiltration of air and escape of the protective gases used in heat treating, bright annealing, brazing and other processes.

The Electric Furnace Company, Salem, Ohio, uses Murex Genex for welding their large gas-tight furnace chambers, some of which are over 150 feet in length. This outstanding E-6012 electrode not only assures sound, tight welds, but also provides real welding economy. Genex can be used at exceptionally high currents without overheating and without excessive spatter. This means higher welding speeds . . . lower welding costs.

The M & T line includes covered and lightly coated electrodes for downhand and all-position work on mild and low alloy steels, and for stainless steels, bronze and aluminum as well as for hard surfacing and tool and die work. No matter what your problem, there is an M & T electrode to solve it. Write for catalog today.

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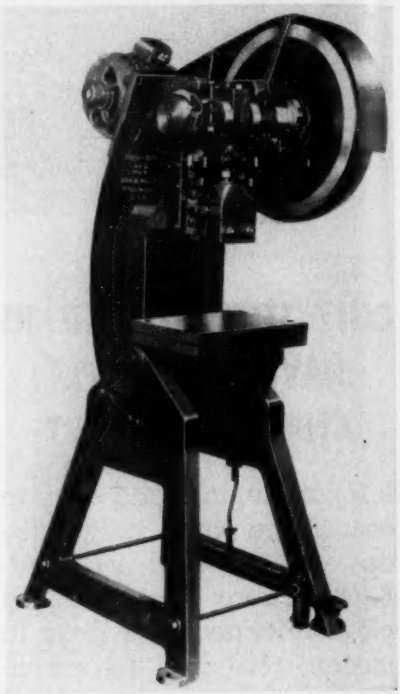
M&T WELDING ACCESSORIES

justed because of light or heavy dies or hot brakes. Only adjustment required is for the usual wear. Clutch engaging and disengaging pawl is operated by a built-in cam built in the crank drive integral collar of the



crank. Cam revolves with the crank and when the clutch is tripped by a foot treadle, the pawl is locked in a positive position until the clutch dog is completely disengaged.

8. Optical Comparator

Designed for inspecting foil contours on turbine blades is the special blade checking optical comparator announced by Jones & Lamson Machine Co., Springfield, Vt. Lens system of the comparator will take a 6 inch diameter inspection area and project it at 5 magnifications on a 30-inch screen.

Lens aperature is 6 5/8-inches in diameter. It has a back focal length, or working clearance of 12 1/2-inches. A specially designed condensing lens is part of the equipment.

9. Dust Collector

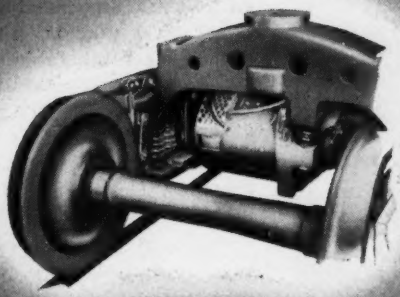
Aget-Detroit Co., Main at Washington, Ann Arbor, Mich., is announcing a self contained, unit type Dustkop dust collector with large volume dust storage capacity and employing a roll-a-way bin with clamp-down cover, permitting easy removal to point of disposal. Removal of collected dusts is quick, release of four latches making removal possible.

Suction capacity of the model 11B50

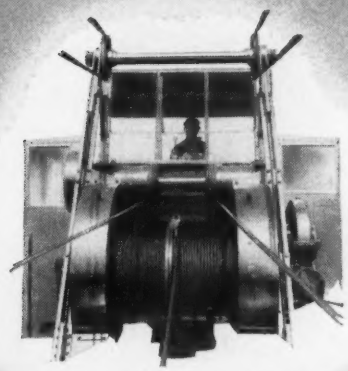
BROWNHOIST DIESEL ELECTRIC LOCOMOTIVE-CRANE

Sets a new high in crane efficiency and economy.

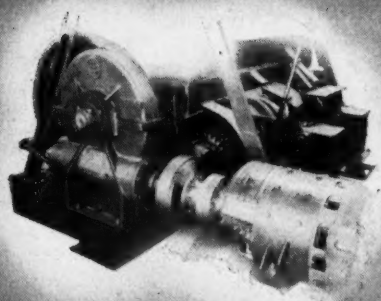
... AND HERE ARE 4 REASONS WHY



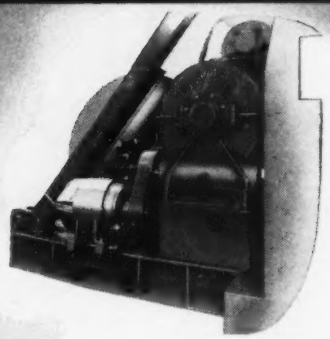
1 Travel clutches and complicated gearing have been eliminated by installing spring mounted motors inside the A.A.R. cast steel side frame trucks to supply travel power to axles.



2 Operator in Monitor-type cab has 360° visibility and an unobstructed view of hoist and boom drums for faster, safer crane operation.



3 Motor current is provided by generator direct connected to diesel engine. Helical gear reducer supplies power for hoist drums, swing, and boom hoist.



4 Electric swing is available, with power supplied by separate generator which is also provided for magnet service and night lighting.

Illustrated are only a few of the features engineered into the new Brownhoist Diesel Electric Locomotive-Crane. In addition, 15 M.P.H. travel speeds, coupled with plenty of power, make it a *quick-accelerating switch engine that will keep cars rolling* in and out of your yards. Hoist drums are mounted on roller bearings, with clutch and brake bands on separate flanges. All boom cable is taken on the drum in one lap, hence no overwinding. Safe worm driven boom hoist and 14″ safety clearance between rotating superstructure and car body *means added safety for your workmen.* And, of great importance in these days of increased operating costs, you get top economy from cheap fuel. Write today for complete particulars.

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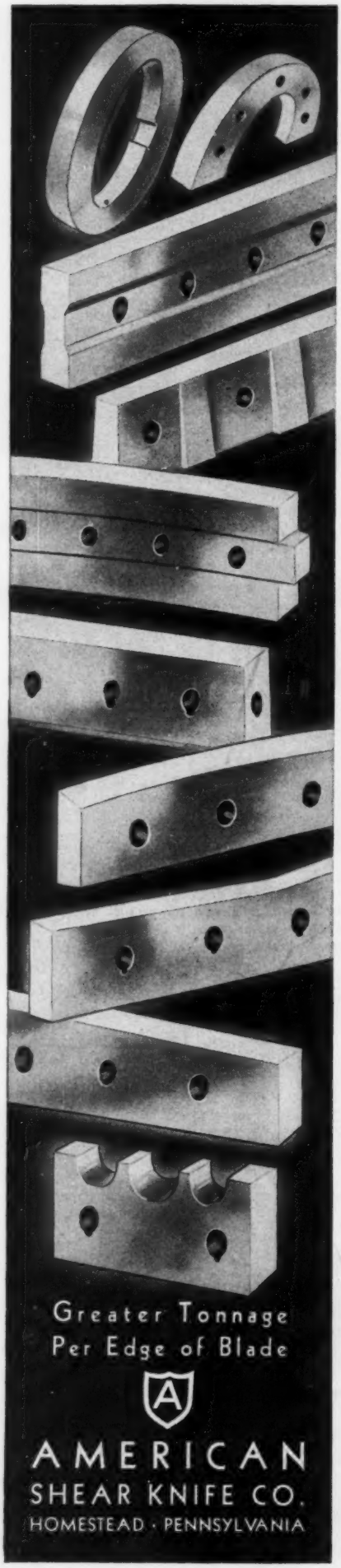
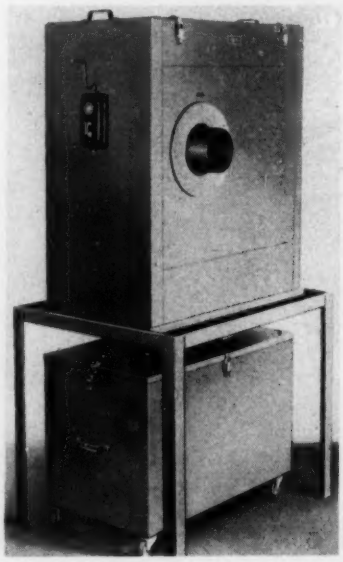


unit on a 6-inch inlet is 1394 cubic feet per minute at 3.2 static suction. This is developed by 1 1/2-horsepower, 3450 revolutions per minute continuous duty motor, direct driving a nonclogging, paddle wheel type



fan. A cyclone separator gives air its first cleaning and a spun glass filter the second, before returning it to the working space. Shakedown of filter is by hand crank.

10. Storage Bin

With a four-way entrance for use with a hand, power lift or fork truck, the new type all steel storage bin, developed by Palmer-Shile Co., 16025 Fullerton Ave., Detroit 27, Mich., can be tiered. It can be built with crane lugs for use with an overhead hoist.

Bin is constructed of heavy steel plate with legs and corner reinforcements of angle iron. It has sturdy corner plates for stacking. Extra strength is provided by flanged top edge. Inside length, width and depth dimensions are 36 x 36 x 24 inches.

11. Lever Operated Hoist

Lifting and pulling by the lever operated Tugit hoist, developed by Manning, Maxwell & Moore Inc.'s Shaw-Box Crane & Hoist Division, Muskegon, Mich., is effected by a lever acting on a gear train in the same manner as in hand or electrically operated hoists. Available in capacities of 1 and 2 tons, the hoist has a Weston type load brake interposed between operating lever and lifting pocket wheel.

Hoist is equipped with antifriction bearings throughout. Because of its construction greater loads may be lifted with less operator effort. A pull of only 40 pounds is required to lift a load of 2000 pounds. The 12-inch handle makes possible operation in close quarters. Units weigh 14½ and 18¾ pounds, respectively.

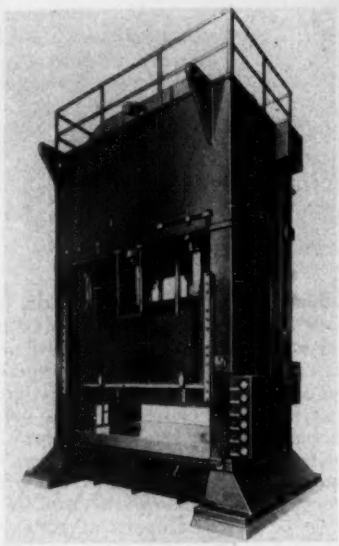
12. Hydraulic Table

For special applications requiring an adjustable pedestal with a capacity of 2000 pounds, a standard hydraulic elevating table without a top is offered by Lyon-Raymond Corp., 4892 Madison St., Greene, N. Y. An 8 x 10 in. bracket is furnished for mounting special tools and fixtures. Platform elevation is from 28 to 44 inches.

Platform can be locked in one position or allowed to revolve freely. Stability is provided by a 30 x 30 inch base. Two 5-inch swivel and two 5-inch rigid casters make it easy to move. A floor lock is provided. Elevation is by a hydraulic cylinder and single speed foot pump with pedal release.

13. Drop Drawing Press

Two principles of force application—mechanical and hydraulic—are combined in the double action deep drawing type MH presses, announced by Verson Allsteel Press Co., 1355 East 93rd St., Chicago 19, Ill. They have the high productive capacity



of the mechanical drawing press plus the adjustable blankholder features of the hydraulic press. All are quickly convertible from double to single action work. Press cycle is fully automatic.

Advantages claimed for this type of press include: Increased production on deep draw; instantaneous ad-

(For more information, use the card following page 134.)

SOUTH BEND PRECISION LATHES have solved the production of precision parts for many manufacturers. Their accuracy, speed and adaptability to a wide range of operations contribute to efficient machining. Perhaps you are running some small, precision jobs on slow, heavy machines. If so, you should find out about South Bend Precision Lathes. These are the kind of jobs for which they are built. Their use can often effect appreciable savings. And, being reasonable in price, they can be installed without excessive capital investment.

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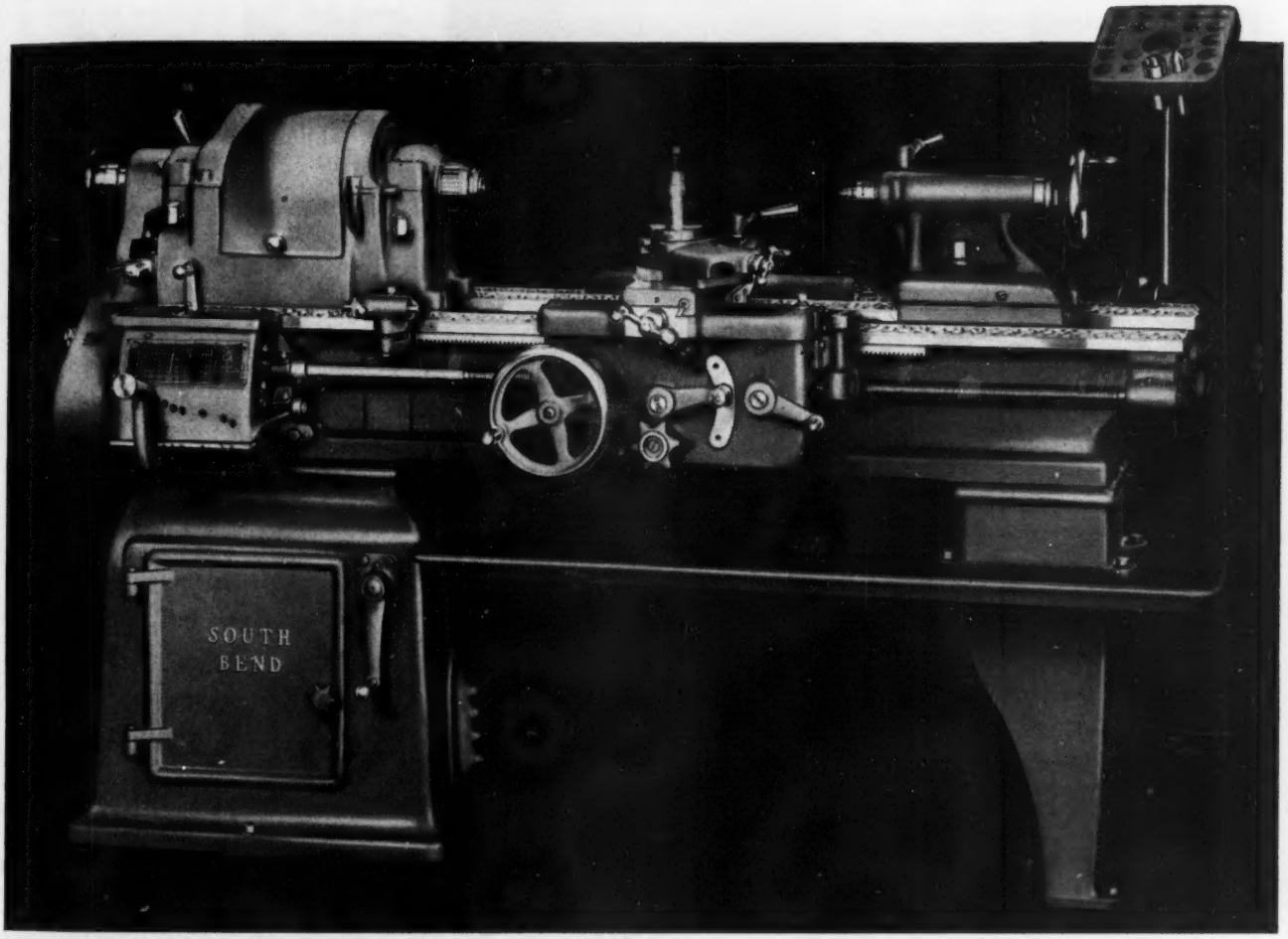

16" x 6' TOOLROOM LATHE
with handwheel collet attachment; collet rack; taper attachment; micrometer carriage stop; chip pan; thread dial; 3 phase, 60 cycle, 220 volt motor; and drum switch. Catalog No. 8117-C. **$2031.50**

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LATHE SIZE	QUICK CHANGE GEAR MODEL	TOOLROOM MODEL
16" x 6' Lathe	$1640.50	$2031.50
14½" x 5' Lathe	1382.50	1735.50
13" x 5' Lathe	1153.50	1481.50
10" x 3' Lathe	863.60	1151.60
9" x 3' Bench Lathe	312.70	481.70

Prices include 3 phase, 60 cycle, A. C. motor and drum switch — f.o.b. factory

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justment of pressure by valves and direct reading gages at any pressure point on the blankholder; self adjusting blankholder for any stock thickness; no tool damaging impact between blankholder, stock and die.

14. Coolant Pumps

Two new seal-less coolant pumps, designed by Allis Chalmers Mfg. Co., Milwaukee 1, Wis., for general circulation duty and machine tool applications, are of the low-head, single stage types, close-coupled to the motor. Added to the company's Norwood line, the pumps—a vertical submerged and a side-wall mounted unit—are available in 1/4 to 1-horsepower sizes, 1 and 1-1/4-inch, 10 to 75-foot heads, 1725 to 3450 revolutions per minute.

Double-suction, open-impeller, submerged type is constructed for vertical operation with flooded suction at all times. Known as the KF type, it is designed for use on machines requiring large coolant tanks. Liquids containing considerable amounts of chips or abrasive particles may be handled. Side-wall mounted type KW is for handling solids, gritty or abrasive particles from grinding and honing machines. It is offered with two different length adapters depending upon coolant tank depth.

15. Hidden Arc Welder

Versatility of the hidden arc process is increased by manual Lincolnweld equipment, developed by Lincoln Electric Co., Cleveland 1, O. Simplified, flexible and maneuverable welding equipment produces smooth, deeply penetrating, spatter-free welds. Equipment is self sufficient and portable for semiautomatic welding, providing all necessary welding current and auxiliary power plus the automatic wire feed mechanism and controls.

Basic element of unit is a standard 600 ampere welder which can be used for straight manual welding as well as semiautomatic welding. Mounted on welder is a compact unit containing wire reel, feed mechanism, drive motor and voltage controls. A special cable to which is attached a cone-shaped welding gun completes the equipment. Gun holds 3½-pounds of flux, dispensed by gravity. Electrode wire of 5/64-inch diameter is used.

16. Roller Bearing

Tru-Rol, a precision cylindrical roller bearing with steel retainer, is announced by Rollway Bearing Co. Inc., Syracuse, N. Y. Retainer has pockets with deep, broad, double flanges in which rollers are kept in alignment. Additional bearing components are in the outer race with deep, accurate ring grooves in the inside diameter into which fit the heavy snap rings that retain the

(For more information, use the card following page 134.)

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BY AMERICA'S LARGEST INDUSTRIAL PLANTS TO DO THE TOUGHEST BLASTING AND PEENING OPERATIONS

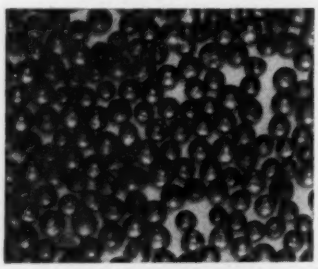
HI-GRADE METALLIC

FAMOUS
FOR ITS ABILITY TO STAND UP UNDER REPEATED HARD USE

SHOT AND GRIT

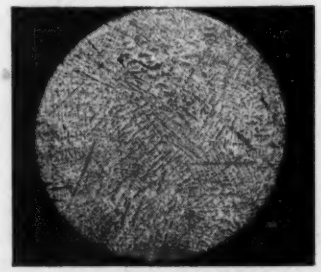
- ROUND
- UNIFORM IN SIZE
- UNIFORM IN HARDNESS
- LACKS IRREGULAR SHAPES

- RECTANGULAR
- SHARP
- TOUGH
- DURABLE



UNRETOUCHED PHOTO OF HI-GRADE SHOT

CLAYTON-SHERMAN ABRASIVES COMPANY
3896 LONYO ROAD
DETROIT 10, MICHIGAN
CEdar 7200



MICROSCOPIC STRUCTURE OF METAL

No Limit to the uses for HANSEN COUPLINGS

NEEDED IN EVERY FLUID LINE

Economies are created in every plant by the use of HANSEN couplings in fluid lines. The quick-connective and shut-off features of these couplings save you time and money, and the variety of jobs they do is endless.

HANSEN couplings make connections and change-overs a matter of seconds. Costly operations are not interrupted . . . equipment continues to produce. Connection is made by pushing plug into socket . . . flow starts at once, automatically. Slight movement of the socket sleeve releases plug, and supply line is immediately sealed . . . one-way or two-way shut-off. For applications where no closure is desired, a "straight through" series has been designed.

Each HANSEN coupling is engineered for the service for which it is recommended, and there is no limit to the uses for HANSEN couplings in these services.

Write for Industrial Catalog No. 47

HANSEN REPRESENTATIVES

New England States . . . . A. D. Geiger, Belmont, Massachusetts
Southern Ohio, W. Va., Ky.: Steinhagen Airline Products, Dayton, Ohio
Eastern, Southern States . . . . . B-B Engineering Co., Baltimore, Md.
Colorado, New Mexico, Utah, Wyoming: E. C. Wild Co., Denver, Colorado
Southwest Territory . . C. C. Brownfield, Dallas, Texas
Arizona, So. California . . . . . Burklyn Company, Los Angeles, California
Idaho, Oregon, Washington . . . Jack J. Kolberg, Seattle, Washington
Central Western States . . . John Henry Foster Company, St. Louis, Missouri, Minneapolis, Minnesota
Northern Cal., Nevada . . H. E. Linney Company, Oakland, California
Michigan . . William H. Nash Company, Detroit, Michigan
Indiana, Wisconsin . . Nek Engineering Company, Ft. Wayne, Indiana
Northern Illinois, Eastern Iowa: Walter Norris Engineering Co., Chicago, Ill.
Northern Ohio: F. & W. Ursem Company, Cleveland, Ohio

IN CANADA

Province of Ontario . . . . . John Best Associates, Toronto, Ontario
Eastern Canada . . . Cowper Company Ltd., Montreal, Quebec

QUICK CONNECTIVE FLUID LINE COUPLINGS

THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

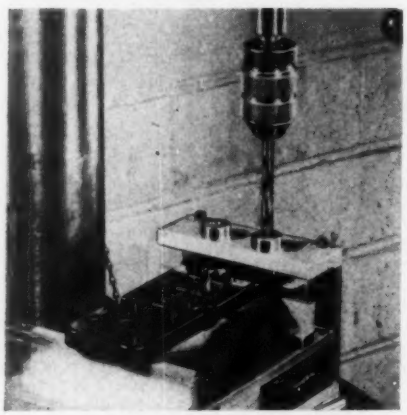
roller retainer and rollers in the outer race.

Inner race is separate and is interchangeable. Bearings are manufactured in a range of sizes conforming with SAE standards. Any Tru-Rol bearing can be applied using the inner race, or without the inner race, depending upon the particular application.

17. Drill-Reamer

Possibility of drilling and reaming in one continuous stroke is realized with the high speed drill-reamers, offered in five standard sizes by Severance Tool Industries Inc., 770 Iowa St., Saginaw, Mich. The drill section provides for drilling through materials of any thickness up to that equalling their diameter, plus an allowance for grinding the drill point a number of times.

Reamer section has teeth of unusual shearing qualities so arranged

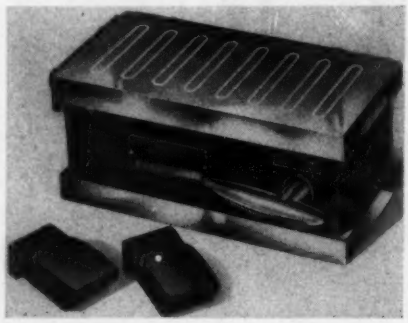


as to preclude chatter and expel the fine chips into the main flutes of the tool. Drill-reamers having longer than standard pilot drills are furnished to order for thicker materials, as are solid carbide tools. Standard sizes offered are 3/16, 1/4, 3/8, 1/2 and 9/16-inch diameters.

18. Magnetic Chucks

Four additions to its line of permanent magnet type magnetic chucks are offered by Brown & Sharpe Mfg. Co., Providence 1, R. I. No. 408 (illustrated) has a 4 x 8-inch working surface and is suited for use on small surface grinding machines, bench grinders, etc. Work is held securely when handle is turned to "on" position and released by a 180 degree turn to "off". Close pole spacing permits its use with small work pieces.

Rectangular model 4 x 12-inch magnetic chuck No. 412 has two line pole spacers and is useful for grinding rows of small parts. Rotary model No. 5R will hold work from ¾ to 5 inches in diameter and work is held and released by a 30-degree turn of control ring. Rotary model No. 7R holds work from 1 5/16 to 7 inches in diameter. Like No. 5R, it may be



adapted to various B & S machines. All models may be used for wet or dry grinding. Adapters and adapter pulleys are available.

DEVELOPED BY . . .

19. Scientific Research Co., Portland 12, Ore., a radius extension bar for flash circle burner, made of rigid cold rolled steel. Unit, cadium plated, was designed to eliminate guesswork, save time and increase utility of any flame cutting torch, by making possible easy cutting or circles, curves, straight lines, etc.

20. Portable Electric Tools Inc., Chicago 20, Ill., Hi-Power model 77 electric drill kit with a ¼-inch portable electric drill and 10 high speed drills in a steel carrying kit. Motor operates on 110 volts, alternating or direct current.

21. Applied Research Laboratories, 4336 San Fernando Rd., Glendale, Calif., new recording system using removable plastic panels with direct reading scales for each element to be determined on the Quantometer for spectrochemical analysis.

22. Sheffer Collet Co., Traverse City, Mich., padded pusher with long bearing surface with external threads ground from the solid to assure concentricity. Pads, available in four materials, are quickly changed to handle stock of various sizes. Tension is readily adjusted.

23. Manhattan Rubber Division, Raybestos-Manhattan Inc., Passaic, N. J., the Ray-Man V-belt for tough rugged drives. It features oil, heat and static resistance.

24. Macwhyte Co., Kenosha, Wis., "Safe-Lock" portable swaging machine for attaching cable terminals to ends of small cables. It will attach various terminal types to cable diameters of 1/16, 3/32, 1/8, 5/32 and 3/16-inch.

25. Beaver Pipe Tools Inc., Warren, O., No. 77 adjustable threader made especially for power drive use. Threader, with range of ½ to 2 inches, is "thrown open" when threading is completed, eliminating backing off. Dies are available in 186 types and sizes.

26. Molly Corp., Reading, Pa., screw anchor for use in steel, wood or hollow masonry which holds securely without defacing. It is available in diameters from ¼ through 1/16-inch and lengths from 15/16 through 3½ inches.

27. G. H. Leland Inc., Dayton 2, O., extra-precision magnet coils wound by a method which permits most effective use of available space. Coils can be wound in multiples of a half turn per layer and wind a single wire or several lengths of the same size in parallel. Resistance, weight and dimensions are precisely calculated.

28. Oakite Products Inc., New York 6, N. Y., No. 97 emulsifiable solvent cleaner which dilutes with water for cleaning of metal parts in pressure spray type washing machines. It removes buffing, drawing and stamping compounds, oils, dirt, etc.

29. Rapids-Standard Co. Inc., Grand Rapids 2, Mich., roller gravity conveyor in new widths of 15 and 24 inches. Conveyor channel is 3½ inches deep and 1 inch wide, reinforced with cross angles. Lengths are offered in 5 and 10 foot lengths.

30. Machine Rebuilding Co., Detroit 7, Mich., Rigid hacksaw frame of strong construction, made of a one-piece steel tube back fitted into a machined cast aluminum handle. Construction permits high blade tension without twisting the blade.

31. U. S. Gasket & Shim Co., Hudson, O., a standard set of shims (one 0.020, three 0.005, three 0.007-inch shims) which can be furnished in any shape or size with any bolt hole arrangement. They may be fabricated of steel, copper, brass, Monel, etc.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

PRODUCTION—Threat of a railroad strike this week, with the possibility of further labor trouble in the coal mines at the end of June, is placing something of a damper on steelmaking and metalworking operations. Steel production has been recovering from the effects of the recent coal strike but not to the fullest possible extent because of small coal inventories and the general desire to conserve stocks as a protective measure against a possible tie-up in transportation. Metalworking operations likely will be curtailed quickly in event of a rail strike since consumers' steel stocks are very low.

Some producers are keeping blast furnaces under reduced draft pending clarification of the railroad situation. Also, sellers of coke are taking orders sparingly for the present. This general situation is reflected in steelmaking activities, and with the uncertainty as to what will happen with respect to coal mining before mid-summer, steel production may continue to lag at the expense of new peacetime records. Up to the end of last week it was estimated the loss of steel output directly attributable to the recent coal strike totaled in excess of 1,500,000 tons.

INGOT OPERATIONS—Steelmaking operations continued to rise last week, reaching 92 per cent of capacity, or 5 points above the preceding week's rate but 4 points under the pre-coal-strike rate of 96 per cent.

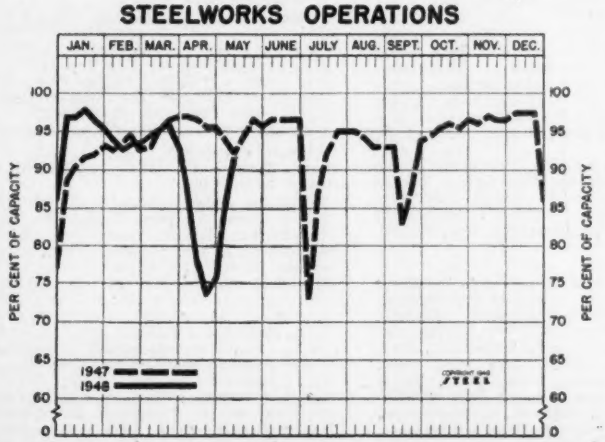
STEEL PRICES—High degree of confusion prevails in the steel markets as the result of multiple prices quoted on various products reflecting irregular reductions over the past 10 days by major producers. The market is best described as in a state of flux with some sellers who have indicated they planned to effect reductions having not as yet announced details, and others, who have not stated their position one way or the other, still watching developments before adopting definite policy. Significantly, new prices are being figured by the separate producers on their actual production costs rather than with an eye to matching competitors' price schedules, a policy without precedent for many years past made possible by the excess of demand over supply.

PRICE COMPOSITES—Reflecting downward revision in prices by several leading producers, STEEL's composite arithmetical price average on finished steel eased to $80.27 last week from $81.14 the preceding week and compared with $69.82 for the like 1947 week. The semifinished steel price average slipped to $68.62 from $68.72 and compared with $52.10 for the like week a year ago. Composites held unchanged last week and compared with those for the like 1947 week at $39.18 and $32.49 for steelmaking pig iron and $40.50 and $29.42 for steelmaking scrap.

FREIGHT RATES—Another factor complicating the price situation is the application of higher freight rates which went into effect May 6. Mill delivered prices, for the most part, will reflect the increased freight immediately at consuming points, but most warehouse steel distributors generally are holding off applying the higher rates to their delivered prices pending clarification of the overall price picture with respect to mill base quotations.

DEMAND AND SUPPLY—As has been the case for many months past the question of steel price continues secondary to that of supply. Recent loss of production due to the coal strike has accentuated shortages in the major products with the result no sign of any easing in tight supply conditions is noted. In event of a nation-wide rail strike metalworking operations will be adversely affected almost immediately since consumer stocks are extremely limited, some plants, including automotive, currently being down to permit inventory accumulation.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended May 8	Change	Same Week 1947	Same Week 1946
Pittsburgh	95.5	+ 3	100.5	45
Chicago	87.5	+ 1.5	78.5	53
Eastern Pa.	86	+ 5	91.5	57
Youngstown	103	+28	91	45
Wheeling	86	+ 6	81.5	74.5
Cleveland	93.5	— 3.5	97	78
Buffalo	87.5	— 0.5	88.5	49
Birmingham	100	None	99	44
New England	81	None	95	80
Cincinnati	91	+ 7	84	89
St. Louis	89.5	+ 0.5	68.5	54.5
Detroit	100	— 1	90	84
Estimated national rate	92	+ 5	92	55.5

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	May 8	May 1	Month Ago Apr. 1948	Year Ago May 1947	5 Years Ago May 1943
Finished Steel	$80.27	$81.14	$81.14	$69.82	$56.73
Semifinished Steel	68.62	68.72	68.72	52.10	36.00
Steelmaking Pig Iron	39.18	39.18	39.21	32.49	23.00
Steelmaking Scrap	40.50	40.50	40.41	29.75	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Apr. 1948	3.57975¢
Mar. 1948	3.57435¢
Apr. 1947	3.12077¢
Apr. 1943	2.42785¢

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composite, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 82 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. March and April figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	May 8, 1948	Apr. 1948	Feb. 1948	May 1947
Steel bars, Pittsburgh	2.875c	2.90c	2.90c	2.60c
Steel bars, del. Philadelphia	3.356	3.356	3.356	2.98
Steel bars, Chicago	2.875	2.90	2.90	2.60
Shapes, Pittsburgh	2.775	2.80	2.80	2.50
Shapes, del. Philadelphia	2.968	2.968	2.968	2.64
Shapes, Chicago	2.775	2.80	2.80	2.50
Plates, Pittsburgh	2.925	2.95	2.95	2.65
Plates, del. Philadelphia	3.19	3.19	3.19	2.85
Plates, Chicago	2.925	2.95	2.95	2.65
Sheets, hot-rolled, Pittsburgh	2.775	2.80	2.80	2.50
Sheets, cold-rolled, Pittsburgh	3.50	3.55	3.55	3.20
Sheets, No. 10 galv., Pittsburgh	3.90	3.95	3.95	3.55
Sheets, hot-rolled, Gary	2.775	2.80	2.80	2.50
Sheets, cold-rolled, Gary	3.50	3.55	3.55	3.20
Sheets, No. 10 galv., Gary	3.90	3.95	3.95	3.55
Strip, hot-rolled, Pittsburgh	3.05	3.05	2.925	2.50
Strip, cold-rolled, Pittsburgh	3.775	3.80	3.675	3.20
Bright basic, bess. wire, Pittsburgh	3.725	3.775	3.775	3.425
Wire nails, Pittsburgh	5.125	5.20	4.95	4.125
Tin plate, per base box, Pittsburgh	$6.65	$6.70	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$56.79	$44.64
Slabs, Pittsburgh, Chicago	45.00	45.00	42.59	37.51
Rerolling billets, Pittsburgh	45.00	45.00	42.59	37.51
Wire rod 7/32 to ¼-inch, Pitts.	3.175c	3.175c	3.175c	2.55c

Pig Iron

	May 8, 1948	Apr. 1948	Feb. 1948	May 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$40.996	$40.996	$40.996	$34.83
Basic, Valley	39.00	39.00	39.00	33.00
Basic, eastern del. Philadelphia	42.17	42.004	42.004	35.52
No. 2 fdry., del. Pgh. (N.&S. sides)	40.496	40.496	40.496	34.33
No. 2 fdry., del. Philadelphia	42.67	42.504	42.504	36.02
No. 2 foundry, Chicago	39.00	39.00	39.00	33.00
No. 2 foundry, Valley	39.50	39.50	39.50	33.50
Southern No. 2, Birmingham	37.88	37.88	37.88	29.28
Southern No. 2, del. Cincinnati	42.71	42.23	40.74	34.75
Malleable, Valley	39.50	39.50	39.50	33.50
Malleable, Chicago	39.50	39.50	39.50	33.50
Charcoal, low phos., fob Lyles, Tenn.	55.00	55.00	55.00	40.50
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.44	$30.00
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	39.125	28.00
Heavy melt. steel, No. 1 Chicago	39.25	39.10	39.125	29.25
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.25	31.55
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	30.75
Heavy melt. steel, No. 1, Buffalo	43.00	43.00	43.63	32.20
Rails for rerolling, Chicago	49.50	49.50	51.00	34.50
No. 1 cast, Chicago	69.00	68.40	66.00	38.50

Coke

Connellsville, beehive furnace	$12.75	$12.50	$12.50	$9.125
Connellsville, beehive foundry	14.875	14.875	14.78	10.375
Chicago, oven foundry, del.	20.75	19.25	19.25	16.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-105 per gross ton.

Skelp: Pittsburgh, 2.85-2.90c; Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to ¼-in., inclusive, $2.80-3.55 per 100 lb. 5/16 to 41/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Birmingham, base, 20 tons one size, 2.85-2.90c; Cleveland, Buffalo, 2.90c; Detroit, del., 3.06-3.114c; eastern Mich., 3.13-3.18c; New York, del., 3.392c; Phila., del., 3.34c; San Francisco (base, del.), 3.5845-3.95c; Los Angeles (base, del.), 3.579-3.86c; Seattle, 3.8375-3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars. Prices upon application.

Hot-Rolled Alloy Bars (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, 3.20-3.30c; Canton, Massillon, Buffalo, Bethlehem, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars (Base 40,000 lb): Pittsburgh, Chicago, Gary, Cleveland, 3.45-3.55c; Buffalo, 3.45-3.55c; Detroit, del., 3.71-3.76c; Toledo, 3.78-3.83c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base 4.10c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Youngstown, Birmingham, 2.70-2.75c; Sparrows Point, Buffalo, base, 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Iron Bars: Single refined: Pittsburgh 7.70c (hand puddled), Economy, Pa., 8.65c. Double refined: Pittsburgh 9.75c (hand puddled), Economy, Pa., 10.00c. Staybolt: Pittsburgh 11.25c (hand puddled), Economy, Pa., 10.20c.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.75-2.80c; Cleveland, Buffalo, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 2.96-3.01c; eastern Mich., del., 3.03-3.08c; Philadelphia, del., 3.18c; New York, del., 3.18c; Los Angeles (base, del.), 3.494-3.544c; San Francisco, (base, del.) 3.4995-3.5495c. (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Gary, 3.45-3.55c; Cleveland, 3.50-3.55c; Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.71-3.76c; eastern Mich., del., 3.78c-3.83c; New York, del., 4.042c; Philadelphia, del., 3.94-4.04c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Gary, Birmingham, 3.85-3.95c; Chicago, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.35c; New York, del., 4.322c; Philadelphia, del., 4.33c; Los Angeles (base, del.), 4.624c; San Francisco (base, del.), 4.6295c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc, Pittsburgh, Chicago, Gary, Birmingham base, 4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.55c; copper-iron or pure iron, 4.90c; Granite City 5.00c and 5.35c, respectively; copper alloy, 4.90c, Kokomo. Los Angeles (base, del.), 5.344c; San Francicso (base, del.), 5.3495c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, 3.85-3.95c; Chicago, Gary, 3.75-3.95c; Cleveland, Middletown, 3.95c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.11c-4.16c; eastern Mich., 4.18c-4.23c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.40-4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, 4.80c-5.30c; Chicago, Gary, 4.70-4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. Electrical: Pittsburgh, 5.20-5.80c; Chicago, Gary, 5.20-5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. Motor: Pittsburgh, 6.05-6.80c; Chicago, Gary, 6.05c; Granite City, 6.50c. Dynamo: Pittsburgh, 6.75c-7.00c; Granite City, 7.20c. Transformer 72, 7.25-8.25c; 65, 7.95-9.20c; 58, 8.65-9.90c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, base, 2.75-2.80c; Detroit, del., 2.96-3.01c; eastern Mich., del., 3.03-3.08c; San Francisco (base, del.), 3.5595c; Los Angeles (base, del.), 3.554c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.50-4.05c; Cleveland, 3.45-3.85c; Youngstown, 3.55-3.85c; Chicago, Gary, 3.55-3.65c; Detroit, del. 3.71-3.76c; eastern Mich., 3.78-3.83c; Worcester, base, 3.65-4.45c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c; over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, per base box of 100 lb, 1.25 lb coating $6.50-$6.60, 1.50 lb coating $6.70-$6.80; Warren, O., $6.60 and $6.80, respectively; Granite City, Birmingham, Sparrows Point, $6.70 and $6.90, respectively.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., per base box of 100 lb, 0.25 lb tin, $5.80; 0.50 lb tin, $6.00; 0.75 lb tin $6.20; Granite City, Birmingham, Sparrows Point, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, per base box of 100 lb, 55 to 70 lb basis weight, $5.10-$5.20; 75 to 95 lb basis weight, $5.00-$5.10; 100 to 128 lb basis weight, $5.10-$5.20. Gary and Warren, O., $5.20, $5.10 and $5.20, respectively.

Hollowware Enameling Black Plate: Pittsburgh, Chicago, Gary, base 29-gage, 4.65-4.75c per lb; Warren, O., 4.75c; Granite City, Sparrows Point, 4.85c.

Manufacturing Ternes (Special Coated): Pittsburgh, $5.80-$5.90; Chicago, Gary, per base box of 100 lb, $5.90; Granite City, Birmingham, Sparrows Point, $6.00.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.30.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.90-2.95c; Cleveland, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, 2.90c; Det., del., 3.21c; New York, del., 3.322c; Phila., del., 3.21c; Boston, del., 3.423c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.693c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 5.10c, basing points.)

Floor Plates: Pittsburgh, 4.05c; Chicago, Gary, Cleveland, 4.05-4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Gary, 3.70-4.137c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, 2.75-2.80c; Buffalo, Bethlehem, 2.80c; New York, del., 3.06c; Phila., del., 2.98c; Geneva, Utah 2.75c; Los Angeles (base, del.), 3.424-3.474c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.4295c for sizes produced at Geneva, 3.81c for sizes produced by Bethlehem in East; San Francisco, del., 3.54c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, Gary, 3.45-3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads
Bright, basic or bessemer *$3.45-4.00
Basic MB Spring (except Birm.).. **$4.85-4.95
Upholstery Spring (except Birm.). †$4.50-4.60

Wire Products to Trade in carloads
Wire, Merchant Quality
Annealed (6 to 8 base) .....††$4.10-4.20
Galvanized (6 to 8 base) .....††$4.55-4.65
(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails
Standard, cement-coated, galvanized.. ‡91-94
Staples, polished and galvanized .... ‡‡91-94
Woven fence, 15½ gage and heavier. §97-100
Barbed wire, 80-rod spool .....§§111-113
Fence Posts (with clamps) ..... ★107
Bale ties, single loop ..... §99

* Worcester, $3.55; Duluth, $3.50, base; San Francisco (base, del.), $4.46, bright basic only.
** Worcester, $4.95; Duluth & Trenton, N.J., $5.10 (bright only); San Francisco (base del.) $5.8845.
† Worcester $4.60; Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.5345 black upholstery.
†† One producer quotes 25 cents higher at Birmingham and Chicago; Worcester $4.20, annealed, $4.65, galvanized; Duluth $4.10, annealed, $4.55, galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.11, annealed, $5.56 galvanized.
‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97; Cleveland 97; San Francisco (base, del.) 112.
‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97, San Francisco (base del.) 112.
§ San Francisco (base del.) 118; Chicago, Birmingham, 94-99.
§§ San Francisco (base del.) 131.
★ Duluth, 104.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.70-$2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.05-$3.10 per 100 lb; light rails (rail-steel), Williamsport, Pa., Pittsburgh prices upon application
Relaying, 60 lb and over fob warehouse $60-$65 per net ton.
Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates $3.55-$3.65 per 100 lb, fob mill; $3.40 base. Seattle; $3.70 base, Pittsburg, Calif. Splice bars $3.65-$3.85 per 100 lb fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.45-4.50c.

Tubular Goods

(New price schedules, effective as of May 1, to be issued.)

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½	36½
¼	44½	21½	1¼	53	37
⅜	41	17	1½	53½	37½
½	47	29½	2	54	38
¾	50	33½	2½ & 3	54½	38½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½
¼	43½	1¼	52
⅜	40	1½	52½
½	46	2	53
¾	49	2½ & 3	53½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+46½	+74½	1¼	+12	+34½
½	+11	+35	1½	+ 6	+27½
¾	+ 1½	+25	2	— 1½	+20
1 and 1¼	— 4	+16½	2½-3½	— 4	+16
1½	— 9½	+13	4	— 8	+10½
2	—10	+12½	4½-8	— 6	+12
			9-12	+ 3	+21½

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D.		Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1"	13	....	$12.46	$11.51	$11.51
1¼"	13	....	14.76	11.48	13.64
1½"	13	$14.00	16.47	12.69	15.22
1¾"	13	15.92	18.74	14.43	17.31
2"	13	17.84	20.99	16.17	19.39
2¼"	13	19.88	23.40	18.02	21.62
2½"	12	21.90	25.77	19.86	23.80
2½"	12	23.99	28.21	21.75	26.06
2¾"	12	25.42	29 90	23.05	27.63
3"	12	26.68	31.40	24.18	29.00
3¼"	11	31.06	36.55	28.16	33.77
3½"	11	33,35	39.26	30.23	36.27
4"	10	41.40	48.70	37.53	44.99
4½"	9	54.87	64.58	....	....
5"	9	63.52	74.74	....	....
6"	7	97.51	114.73	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ⅝ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in and smaller	46 off	.....
1⅛-in. and smaller	.....	44 off
½-in.-1-in.	44 off	.....
⅞-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger 5.65c
Lebanon, Pa. .....
.....5.65c plus 19c per cwt in cl., 26c lcl.
⅞-in. and under ..... 55 off
Lebanon, Pa. .....
.....55 off plus 19c per cwt in cl., 26c lcl.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, cents per lb, Pittsburgh, Chicago, and Washington, Pa.

Grade	Bars, Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50*	51.00*	40.50	51.00
310	53.50	56.50†	57.50‡	53.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
§501	9.00	13.00	17.50	13.00	18.50
§502	10.00	14.50	18.50	14.50	19.50
****STAINLESS CLAD STEEL (20%)**					
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

One producer quotes: * 6.50c higher, † 3.50c higher, ‡ 10.00c higher. § Low chromium.
** Fob Pittsburgh, Washington and Coatesville, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.39	42.89	43.39	43.89
Brooklyn, N. Y., del.	....	44.40	44.90	....
Philadelphia,. del.	42.17	42.67	43.17	43.67
Birmingham, base	35.88†	36.38†	....	....
Cincinnati, del.	....	42.71	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	48.42	48.42	48.92	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.22	40.72	41.22	41.72
Muskegon, Mich., del.	....	43.98	44.48	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.67	41.17	41.67	42.17
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	39.50	40.00	40.50	....
St. Louis, del.	40.25	40.75	41.25	....
‡**Neville Island, Pa.,** base	39.00	39.50	39.50	40.00
Pittsburgh, del., N.&S. Sides	39.996	40.496	40.496	40.996
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Los Angeles, San Francisco.	46.13	46.63	....	....
Sharpsville, Pa., base	39.00	39.50	39.50	40.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	39.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati del.	43.05	43.55	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.87	43.37	43.37	43.87

† Republic Steel Corp quotes $3 a ton higher at Birmingham, effective Jan. 1, 1948; Republic quotes $2.375 higher for No. 2 foundry and malleable and $1.375 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended May 9.

‡ To Neville Island base add: 79.2c for McKees Rocks, Pa.; $1.212 Lawrenceville, Homestead, McKeesport, Monaco; $1.788 Oakmont; $1.596 Verona; $1.788 Brackenridge; 99.6c to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

00-6.50 per cent (base)....$49.50

6.51-7.00..	$50.75	9.01- 9.50.	57.00
7.01-7.50..	52.00	9.51-10.00.	58.25
7.51-8.00..	53.25	10.01-10.50.	59.50
8.01-8.50..	54.50	10.51-11.00.	60.75
8.51-9.00..	55.75	11.01-11.50.	62.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silveryy iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $77.50, Jackson, O.; $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$55.00 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $39.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace..	$12.00-$13.50
Connellsville, foundry..	14.00- 15.75
New River, foundry...	15.50
Wise county, foundry..	14.25
Wise county, furnace..	13.50

Oven Foundry Coke

Kearney, N. J., ovens.	$20.50
Chicago, outside del...	19.50
Chicago, del.	20.75
Terre Haute, ovens....	20.25
Milwaukee, ovens	20.25
New England, del.	20.40-20.45
Birmingham, del.	15.76
Indianapolis, ovens ...	19.60
Cincinnati, del.	18.95
Ironton, O., ovens	16.75
Erie, Pa., del.	21.55
Painesville, O., ovens..	20.00
Cleveland, del.	21.55
Buffalo, del.	20.20
Detroit, del.	19.00
Philadelphia, ovens ...	19.55
Swedeland, Pa., ovens.	19.50
Portsmouth, O., ovens.	17.00

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol.....	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	12.50
Do., less than carlots.....	13.25
Do., tank cars	11.50

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	11.00

Per ton, bulk, fob plants

Sulphate of ammonia.....$40.00	

† Freight allowed up to 2 cents.

Refractories

Net Prices

Per 1000, fob shipping point

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$92.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	73.00
Ala., Ga.	73.00
N. J.	78.00

Intermediate Heat Duty

Ohio	67.00
Pa., Ill., Md., Mo., Ky.	67.00
Ala., Ga.	59.00
N. J.	70.00

Low-Heat Duty

Pa., Md., Ohio	59.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	50.00
Wire Cut	48.00

Malleable Bung Brick

All bases	83.00

Silica Brick

Pennsylvania	73.00
Joliet, E. Chicago	82.00
Birmingham, Ala.	73.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	64.00
Chem. bonded chrome	64.00
Magnesite brick	86.00
Chem. bonded magnesite....	75.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	27.00
Single bags	31.50

Dolomite

Domestic, dead-burned, bulk, net tons, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos....	Nom.
Swedish basic, 60 to 68%	13.50-14.00
Spanish, No. African basic, 50 to 60%.....	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26–$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio.....	31.00

South African (Transvaal)

44% no ratio.....$25.50-$26.00	
45% no ratio	26.50
48% no ratio.....	28.50
50% no ratio.....	29.50

Brazilian—nominal

44% to 2.5:1 lump.....	$33.65

Rhodesian

45% no ratio.....$27-$27.50	
48% no ratio.....	30.00
48% 3:1 lump	39.00

Domestic (seller's nearest rail)

48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

Fluorspar

Metallurical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheet, Hot-Rolled	4.20–4.30	4.20–4.30	4.20–4.30	4.20–4.30	4.30	4.30	...	...	...
Cold-Rolled	5.20–5.30	5.20–5.30	5.20–5.30	5.20–5.30	...	5.30	...	...	...
Galvanized	5.90–6.00	.....	.....	.....	...	6.00	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.20–4.30	4.20–4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30†	5.30†	5.30	...	...	...	...	...
Shapes, Structural	4.20–4.30	4.20–4.30	4.20	4.30	...	...	4.30	...	...
Plates	4.45–4.55	4.45–4.55	4.45–4.55	.....	4.55	...	...	...	...
Bars, Small Shapes....	4.35–4.45	4.35–4.45	4.35–4.45	4.35–4.45	...	4.45	...	4.45	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras. Revisions are pending to reflect recnet changes in mill prices and increases in freight rates.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½"& up	H-R Alloy (**4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ⅜" & Thicker
Boston (city)	5.03	6.09[4]	5.79[4]	6.23[4]	7.58[4]	5.61	6.87	5.04	5.88	7.64	4.91	5.18	6.86
New York (city)	4.96	6.16	5.86	6.16	7.51	5.59	...	5.06	5.63	7.23	4.80	5.11	6.78
New York (country)	4.81	6.01	5.71	6.01	7.36	5.44	...	4.91	...	...	4.65	4.96	6.63
Philadelphia (city)	4.70	6.32	5.92	5.90	7.25	5.32	5.72	4.87	5.75	8.77	4.57	4.85	6.47
Philadelphia (country)	4.55	6.18	5.78	5.75	7.10	5.17	5.57	4.73	...	...	4.47	4.71	6.32
Baltimore (city)	4.32†	5.95	5.65	5.72	7.07	4.80	...	4.85	5.71	...	4.71	4.77	6.30
Baltimore (country)	4.17†	5.80	5.50	5.50	6.85	4.65	...	4.70	...	...	4.56	4.62	6.15
Washington (city)	4.81	...	...	...	...	5.08	...	5.14	5.79[12]	...	4.98	5.03	6.60
Washington (country)	4.71	...	...	...	...	4.98	...	5.04	...	...	4.88	4.93	6.50
Norfolk, Va.	4.90	...	...	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis, Tenn. (city)	4.82[20]‡‖	5.87[20]†	...	6.37	...	5.02[20]	...	4.97[20]	5.87	...	4.97[20]	5.17[20]	6.87[20]
Memphis, Tenn. (country)	4.72[20]‡‖	5.77[20]†	...	6.27	...	4.92[20]	...	4.87[20]	5.77	...	4.87[20]	5.07[20]	6.77[20]
Buffalo (city)	4.45	...	5.20[8]	6.05	...	5.25	5.65	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (country)	4.30	...	5.05[8]	5.50	...	4.70	5.50	4.25	4.95	6.85	4.25	4.45	5.75
Pittsburgh (city)	4.25‡‖	...	5.10[8]†	5.65	6.90	4.35	5.35	4.40	5.10	6.85	4.40	4.60	5.90
Pittsburgh (country)	4.10‡‖	...	4.95[8]†	5.50	6.75	4.20	5.20	4.25	4.95	6.85	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[8]	5.20[8]	5.82	7.17	4.55	5.35	4.40	5.10	7.26	4.70	4.60	6.05
Cleveland (country)	4.30	5.35[8]	5.05[8]	...	...	...	5.20	4.25	4.95	...	...	4.45	5.90
Cincinnati	4.56	...	5.22	5.77	...	4.77	...	4.78	5.63	...	4.82	4.98	6.47
Detroit	4.55	...	5.30	...	...	4.72	5.63	4.50	5.22	7.10	4.77	4.88	6.28
Indianapolis	4.55	5.32[8]	...	5.87	7.12	4.65	5.90	4.70‡‡	5.40	8.85	4.70	4.90	6.35
Chicago (city)	4.45	5.50[8]	5.20[8]	5.65	6.90	4.35	5.45	4.40	5.10	6.85[9]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[8]	5.05[8]	5.50	6.75	4.20	5.30	4.25	4.95	6.85[9]	4.25	4.45	5.90
Milwaukee	4.658	5.708[8]	5.408[8]	5.858	7.108	4.558	5.658	4.608	5.308	7.208[9]	4.608	4.808	6.258
St. Louis	4.78	5.83[8]	5.53[8]	6.02	7.27	4.68	5.82	4.73	5.47[12]	...	4.73	4.93	6.38
Birmingham (city)	4.45[20]‡‖	...	...	5.65	...	4.45[20]	...	4.40[20]	5.93[22]	...	4.40	4.65	6.86
Birmingham (country)	4.30[20]‡‖	...	...	5.50	...	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
New Orleans	4.98[20]**	...	6.29[18]	...	...	5.18[20]	...	5.13[20]††	6.29[11]	...	5.03[20]††	5.33[20]	7.29[20]
Omaha, Nebr.	5.462	...	...	6.712	8.012	5.362	...	5.412	6.112	7.562	5.412	5.612	7.062
Houston, Tex.	5.75	...	...	7.36	8.10	6.00	...	5.35	7.00[12]	...	5.85	5.85	6.50
Los Angeles (city)	5.75	7.75[8]	7.45[8]	7.40	8.80	6.05	8.70	5.50	7.35[22]	9.35[10]	5.35	5.55	7.65
Los Angeles (country)	5.60	7.60[8]	7.30[8]	7.25	8.65	5.90	8.55	5.35	7.20[1]	9.20[10]	5.20	5.40	7.50
San Francisco	5.40[21]	6.65[8]	...	7.05[8]	7.95[8]	5.75[21]	8.70[18]	5.05[21]	7.00[12]	...	5.30[21]	5.50[21]	7.10[21]
Seattle, Tacoma, Wash.	5.30[17]‡‖	...	7.10[8]‡	6.95	...	5.60[17]	...	5.45[17]	7.45[19]	8.50[12]	5.25[17]	5.55[17]	7.65[17]
Portland, Oreg.	5.30[17]‡‖	...	7.10[8]‡	6.70	...	5.60[17]	...	5.45[17]	7.45[19]	...	5.25[17]	5.45[17]	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [4]—three to 24 bundles; [8]—450 to 1499 lb; [9]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [18]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ add 15c per 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh, 16% to 19% Mn., $51 Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l.,8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si. carload packed 10.9, ton lot 12.35c, less ton 14.0; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained, Si carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¼ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c ton lot 14.0c, less ton 14.9c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

(Please turn to Page 162)

Metal Supplies Tightening

Government decides to re-enter market to achieve stockpiling goals. Copper and aluminum industries to be asked to allot tonnages under defense program

New York—A tightening in metal supplies over the balance of this year is exepected to develop as a result of European Recovery Plan and stockpiling demands. This has been emphasized recently by executives of nonferrous producing companies in their annual reports to stockohlders.

An average of 90 per cent of the 67 strategic and critical materials purchased for the national stockpile are obtaned from foreign sources, Rear Admiral Roger W. Payne, representing the Munitions Board, told the Subcommittee on Mines and Mining of the House Public Lands Committee last week. The Board now believes the time has arrived to place national stockpiling objectives ahead of civilian needs. "We are now preparing to go into the market on all materials and will make our purchases either from domestic producers or in the western hemisphere," Admiral Payne told the committee.

Officials of the copper industry are expected to be called in under Public Law 395 to prepare for allocations of large tonnages of copper involved in the air force expansion program.

Copper—C. D. Dallas, chairman of the board, Revere Copper & Brass Inc., pointed out that early forecasts of European consumption of copper under the ERP indicate that shipments from the western hemisphere to Europe will be greater in 1948 than in 1947. "Meanwhile the needs of our own country for copper imports are officially estimated at 450,000 tons for 1948, against 400,000 in 1947. This may be increased further if foreign copper is sought for stockpiling. Thus, while we do not expect serious shortages of the metal needed in Revere's business, we cannot with confidence look for any lower prices."

Demand for copper is strong but Kennecott Copper Corp. will oppose any increase in the price, E. T. Stannard, president, told stockholders. He said the government is pressing for metal to be stockpiled and that about 12,000 to 15,000 tons of copper a month are to go to ERP nations from South American mines in 1948. He also said that demand for copper from domestic wire companies had been quite good up to the beginning of March, but since then has receded slightly. Orders from the brass mill industry, which increased late last year, has tapered off recently.

Lead—Smelter receipts of lead in ore declined almost 3950 tons to 36,981 tons during March, while receipts of scrap were off 370 tons to 3281 tons, according to the American Bureau of Metal Statistics. The decline in receipts of ore was the result of the strike in Mexico which was the chief cause of the sharp drop in receipts of foreign ore to only 2796 tons from 8508 tons in February. Receipts of domestic ore in March, however, increased to 34,185 tons from 32,414 tons in February. Total receipts of lead in ore and scrap by smelters during the first quarter amounted to 128,310 tons, slightly below the 129,217 tons reported in the similar period of last year.

Aluminum—Indications are that the aluminum industry shortly will be called by the Office of Industry Cooperation under Public Law 395 to prepare for allocations of large tonnages of aluminum involved in the air force expansion program.

Zinc—An advance in the price of zinc is now considered less likely due to price reductions recently announced in the steel and electrical industries. Agitation for higher prices continue, however, in the Tri-State district. Marginal mining operations in that district are being curtailed steadily. Tailing plant operations have been practically at a standstill and some mines already have been flooded or abandoned.

Tin—Exports of tin concentrates from Bolivia contained about 3650 tons of fine tin, according to unofficial reports for March.

Recovery of secondary tin at detinning plants, as metal and in chemical compounds, increased 10 per cent in 1947 over that of 1946, according to the Bureau of Mines. This represents the first increase since 1942. Recovery of tin from new clippings and old tin-coated containers totaled 3447 net tons in 1947 compared with 3144 tons in 1946 and 3981 tons in 1945. Of the 3447 tons of tin recovered, 2046 tons were reclaimed as metal in the form of pigs and anodes, and 401 tons in the form of tin compounds. All of the gain was in tin recovered from new clippings, which increased from 2884 tons in 1946 to 3313 tons in 1947, or 15 per cent.

Lead Industries Analyzes Postwar Production Record

New York — Lead mine production in the United States has been constantly on the increase since removal of wartime controls and government subsidies, the last of which ended on June 30, 1947, according to an analysis of recent production statistics just issued by the Lead Industries Association. The fact that an extreme shortage of lead exists today results from the unprecedented demand for the metal and not from failure of the mines to step up production so far as possible under current labor and material shortages.

United States mine production of lead in February, 1948, was at the highest daily rate for any month since May, 1945, according to statistics of the United States Bureau of Mines. Prelimnary figures for March show a further increase in the daily rate over February. It is estimated that, barring strikes or other unforeseen developments, production for the full year 1948 will exceed 1947 production by at least 10 per cent, perhaps 15 per cent.

A vast amount of exploration and development work, entirely privately financed and without the aid of any governmental subsidy, is now in progress to find and open new ore bodies. Excellent results have already been achieved, especially in Idaho where new rich ore bodies have been opened at deep levels and where production has increased about 25 per cent in the last eight months.

Still other development programs are still in progress and cannot be expected to show results until late 1948 or 1949. Every issue of mining papers or magazines in recent months has carried reports of new mine openings or of old mines reopening. This is not confined to the United States alone, as several foreign properties show excellent possibilities.

The following table shows lead mine production of the United States as reported by the U. S. Bureau of Mines for the eight months since the end of government subsidies and for the corresponding months a year earlier when subsidies were received.

	1946 (Tons)	1947 (Tons)
July	25,044	29,106
Aug.	28,610	30,597
Sept.	27,229	30,647
Oct.	25,875	32,512
Nov.	27,872	30,618
Dec.	28,065	30,567
	1947	1948
January	31,066	33,230
February	29,817	32,029
Average	27,947	31,163

Metal Subsidies May Be Required to Boost Output

Washington — Premium payments or other incentives may be necessary to build up federal stockpiles of strategic minerals. This was reported to the Interior Department by its advisory council, made up of executives of large and small mining companies. The council recommended that the advice of defense authorities be sought on whether special legislation to increase production of minerals is needed at this time.

Meanwhile, the European Recovery Plan already has resulted in a sharp increase in the foreign demand for nonferrous metals.

WAA Pushes To Sell Remaining Metal Stocks

Washington — With more than 90 per cent of its inventory of surplus metals and metal products disposed of, War Assets Administration has announced that remaning stocks of these materials, except steel sheets and standard-size pipe, will be offered for sale on a competitive bid basis.

Previously, most surplus metals and metal products were sold at fixed prices. All but about 10 per cent of an $800 million inventory of surplus iron, steel, nonferrous metals, metal products, valves and fittings already have been channeled into industry by WAA.

Remaining inventory will be offered in small lots whenever feasible. Priority rights will be observed in making awards on bids.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted.)

Copper: Electrolytic, 21.50c, Conn.; Lake, 21.62½c, Conn.

Brass Ingot: 85-5-5-5 (No. 115) 19.25c; 88-10-2 (No. 215) 28.00c; 80-10-10 (No. 305) 24.25c; No. 1 yellow (No. 405) 15.25-16.00c. Prices include 25 cents per 100 lb freight allowance.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

Lead: Common 17.30-17.35c; chemical and corroding 17.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00c, pigs 14.00c; metallurgical 94% min. 13.50c. Base prices for 10,000 lb and over, fob shipping point.

Secondary Aluminum: Piston alloy (No. 122 type) 18.50-18.75c; No. 12 foundry alloy (No. 2 grade) 18.00-18.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.50-19.25c; grade 2 18.00-18.50c; grade 3, 17.75c; grade 4 17.00-17.50c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) 94.00c; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, 93.85c; grade C, 99.65-99.79%, incl., 93.50c; 99.5-99.64% 93.50c; grade F, 98-98.99% 92.60c for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American, 99-99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 33.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 33.75c; 25-lb pigs, 35.25c; shot, 36.25c; "F" nickel shot or ingots, for addition to cast iron, 34.25c. Prices include import duty.

Mercury: Open market, spot, New York, $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $98-$101 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 15.00c; 1000 to 19,900 lb, 14.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c, 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 23.50c; 275-lb, or 500 bbls. 21.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 110.00c; 500 to 999 lb, 110.50c; 200 to 499 lb, 111.00c lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 999 lb. 112.75c; 200 to 499 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Potassium Stannate: 350 to 1050 lb, 65.00c; 1400 to 2100 lb, 62.50c; 2450 lb and more, 61.50c.

Stannous Sulphate: Less than 2000 lb, 94.00c; more than 2000 lb, 93.00c.

Stannous Chloride (anhydrous): 400 lb-bbls, 89.00c; 100-lb kegs, 90.00c per lb.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, fob mill.)

Sheet: Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c.

Seamless Tubing: Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c.

Wire: Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80c, l.c.l. 27.30c; weatherproof, fob eastern mills, c.l. 27.35c, l.c.l. 27.85c; magnet, delivered, c.l. 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, l.c.l. 30.50c-31.88.

ALUMINUM

(Base prices, fob shipping point)

Sheets and Circles: 2s and 3s mill finish c.l., fob shipping point.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheet, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 54.00c. Strip, cold-rolled, 60.00c. Rods, hot-rolled 50.00c, cold-finished 55.00c. Angles, hot-rolled, 50.00c. Plates, 52.00c. Seamless tubes, 83.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 43.00c; No. 35, 41.00c. Strip, cold-rolled, 44.00c. Rods, hot-rolled 39.00c; cold-finished 44.00c. Angles, hot-rolled, 39.00c. Plates, 41.00c. Seamless tubes, 71.00c. Shot and blocks, 31.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 5%	16.500	16.250	8.250
Phos. bronze, A. B.	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.50, No. 2 copper 17.50, light copper 16.50, composition red brass 15.25, auto radiators 12.25, heavy yellow brass 11.25, brass pipe, 12.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.00, No. 2 copper 18.00, light copper, 17.00, refinery brass (60% copper), per dry copper content 17.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.75-17.00, No. 2 15.75-16.25, light copper 14.75-15.00, No. 1 composition red brass 13.25-13.75, No. 1 composition turnings 12.75-13.25, mixed brass turnings 8.00-8.25, new brass clippings 12.50-13.00, No. 1 brass rod turnings 10.00-10.50, light brass 7.00-7.50, heavy yellow brass 9.50-10.00, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.25-10.75, cocks and faucets 10.50-11.00, brass pipe 10.50-11.00.

Lead: Heavy 15.00-15.25, battery plates 9.25, linotype and stereotype 16.00-16.50, electrotype 13.50-14.00, mixed babbitt 14.25-14.75, solder joints, 17.25-17.75.

Zinc: Old zinc 5.50-5.75; new die cast scrap 4.75-5.25, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 60.00-62.00, block tin pipe 77.00-78.00, auto babbitt 46.50-47.00, No. 1 babbitt 46.50-48.00, siphon tops 45.00-47.00.

Aluminum: Clippings 2S 9.50-10.00, old sheets 7.50-8.00, crankcases 7.50-8.00, borings and turnings 3.00-3.50, pistons, free of struts, 7.50-8.00.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
March Avg.	21.500	14.825	12.000	94.000	15.000	33.000	33.750	74.625
April Avg.	21.500	17.037	12.000	94.000	15.000	33.000	33.750	74.625
May 1-6	21.500	17.30-17.35	12.000	94.000	15.000	33.000	33.750	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.00-36.50
Mixed Borings, Turnings	36.00-36.50
Short Shovel Turnings	36.50-37.50
Cast Iron Borings	36.00-37.00
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.00
Heavy Turnings	40.50-41.00

Cast Iron Grades

No. 1 Cupola	66.00-68.00
Charging Box Cast	48.00-49.00
Heavy Breakable Cast	48.00-49.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	52.00-53.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-57.00
Rails, Random Lengths	60.00-61.00
Rails, 3 ft and under	61.50-62.00
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	54.00-55.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

* Plus applicable freight springboard.

Cast Iron Grades

No. 1 Cupola	67.00-69.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-78.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-78.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	61.00-63.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	56.00-57.00
Angles, Splice Bars	57.00-59.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50

* Plus applicable freight springboard.

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	58.00-60.00
Heavy Breakable Cast	48.00-50.00
Clean Auto Cast	60.00-62.00

BUFFALO

No. 1 Heavy Melt. Steel	$42.00-44.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.50-36.00
Short Shovel Turnings	35.50-36.00
Low Phos.	46.00-47.00

Cast Iron Grades

No. 1 Cupola	66.00-67.00
Mixed Cupola	63.00-65.00
Heavy Breakable Cast	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under	56.00-58.00
Railroad Specialties	52.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.00-43.00
No. 2 Heavy Melt. Steel	39.00
No. 1 Busheling	39.00
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings	34.00-35.00
Bar Crop and Plate	47.00-48.00
Punchings & Plate Scrap	47.00-48.00
Cut Structurals	47.00-48.00
Elec. Furnace Bundles	43.50-44.50
Heavy Turnings	42.50-43.00
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast	66.00-67.00
Charging Box Cast	61.00-62.00
Heavy Breakable Cast	61.00-62.00
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00
No. 1 Wheels	67.00-68.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.03
No. 2 Heavy Melt. Steel	34.03
No. 1 Busheling	34.03
Nos. 1 & 2 Bundles	34.03
No. 3 Bundles	32.03
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings	30.50-31.00
Punchings & Plate Scrap	40.00-41.00
Cut Structurals	40.00-41.00
Elec. Furnace Bundles	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	54.00-56.00
Charging Box Cast	54.00-55.00
Heavy Breakable	54.00-55.00
Unstripped Motor Blocks	51.00-53.00
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.40-31.90
No. 2 Heavy Melt. Steel	31.40-31.90
No. 1 Bundles	31.40-31.90
No. 1 Busheling	31.40-31.90
Machine Shop Turnings	26.90
Mixed Borings, Turnings	26.90
Short Shovel Turnings	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	34.00-35.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-60.00
Heavy Breakable Cast	50.00-53.00
Stove Plate	52.00-55.00
Unstripped Motor Blocks	48.00-49.00
Clean Auto Cast	48.00-50.00

CHICAGO

No. 1 Heavy Melt. Steel	$39.00-39.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Bundles	39.00-39.50
No. 2 Bundles	39.00-39.50
No. 3 Bundles	37.00-37.50
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Short Shovel Turnings	36.00-36.50
Cast Iron Borings	35.00-35.50
Bar Crops and Plate	46.50-47.00
Punchings	48.00-48.50
Elec. Furnace Bundles	40.00-40.50
Heavy Turnings	38.50-39.00
Cut Structurals	44.00-44.50

Cast Iron Grades

No. 1 Cupola Cast	68.00-70.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.25-41.75
Malleable	74.00-77.00
Rails, Rerolling	49.00-50.00
Rails, Random Lengths	48.00-49.00
Rails, 3 ft and under	55.00-56.00
Rails, 18 in. and under	57.00-58.00
Railroad Specialties	49.00-50.00
Angles, Splice Bars	51.00-52.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.50-40.50
No. 2 Heavy Melt. Steel	37.50-38.50
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	59.00-60.00
Heavy Breakable Cast	55.00-56.00
Brake Shoes	57.00-58.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R. R. Malleable	65.00-70.00
Rails, Rerolling	50.50-52.50
Rails, Random Lengths	48.50-50.50
Rails, 3 ft and under	52.00-53.00
Uncut Tires	46.00-47.00
Angles, Splice Bars	48.00-50.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Long Turnings	24.50
Short Shovel Turnings	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Length	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	20.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	14.50-16.50
Mixed Borings, Turnings	14.50-16.50
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

LOGEMANN

Presses for Sheet Scrap

THE NATION NEEDS YOUR SHEET SCRAP!

In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

The line includes scrap presses *designed for mill Service*, presses *designed for automobile plant conditions*, presses *designed for general plant applications*. Write for details.

LOGEMANN BROTHERS COMPANY
3126 W. Burleigh St. **Milwaukee, Wisconsin**

The scrap press illustrated operates in one of the largest industrial plants. Compresses scrap from three directions to produce high-density mill size bundles. Built in various capacities.

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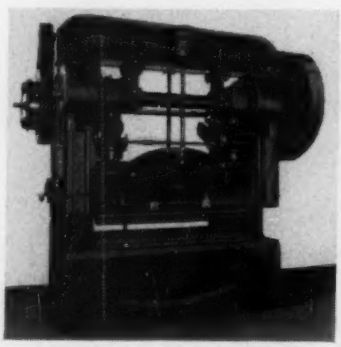

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Steel Bars . . .

Revisions in base prices and freight rates disrupt price situation

Bar Prices, Page 138

New York — Price situation in hot carbon bars still remains to be clarified. Most leading producers have indicated that they will make some reduction in base prices, but whether all will follow the lead of the principal seller in reducing prices $1 remains to be definitely established.

Meanwhile, the trade is also occupying itself with the question of freights rates. The interstate rates in official classification territory went into effect May 6.

This date will be of particular interest to New York buyers, for the reason that Buffalo is the governing basing point and hence the minimum delivered price will not be affected until intrastate action is taken. According to traffic experts, the new Buffalo rate will be 53 cents per hundred pounds.

Most sellers are now accepting specifications from their regular customers for the third quater on the basis of prices ruling at time of shipment. In view of the recent coal strike it is considered possible that buyers may receive as much tonnage in the third quarter as they will receive in the second quarter. However, much depends on what might develop later in the way of labor disruptions. For instance, there may be another walkout at the mines unless contracts due to expire June 30 are adjusted amiably. There appears little doubt, however, that insofar as new quotas are concerned, the rank and file of consumers will receive less in the third quarter than in the current quarter. Not only will substantial arrearages be carried over as a result of recent disruptions, but there probably will be a tightening due to expanding requirements for defense, foreign aid and special domestic demands.

Pittsburgh — Some cold-finished bar producers are no longer meeting the Detroit and Toledo delivered arbitrary prices on carbon bars. It is estimated that over half of all the cold-finished carbon bar tonnage produced is no longer being sold on that price basis. However, some interests are still shipping that product into Detroit at $3.71 per 100 pounds. Discontinuance of the Detroit arbitraries by some companies means that their prices will revert to the nearest basing point of Cleveland or Chicago, which represents a differential of 16 to 21 cents.

Steady upward trend in cold-finished bar demand over recent months has prompted Jones & Laughlin Steel Corp. to go on an allocation basis to protect its long-standing customers. This is an effort to prevent customers in one area of the country from obtaining a larger share of available production than others. Allocations have been set up on quarterly basis to district offices. The company discontinued allocations of bars early in 1947 but resumption of heavy demand has made the return to this policy necessary. Other companies in

this area are expected to follow this selling practice soon.

Boston—Users of carbon steel bars are confronted with more price spreads until competition irons out differences in quotations. Some producers are quoting cold-drawn stock $2 a ton lower, but made no reduction in hot-rolled carbon bars; others have reduced the latter $1 a ton. With higher freights, some hot-rolled carbon bar delivered prices will be higher unless a revision is made. There is also temporary confusion as to basing points, although normally much tonnage comes into this territory on a Buffalo or Youngstown base. Cold-drawn bar mills are now booking tonnage for third quarter and in some cases have allocations equal to those for the second period. From these quotas, however, any carryover tonnage will be taken. There is some slackening in the recent flurry in alloy demand, although most are sold into September on open-hearth alloys with electric furnace deliveries averaging 10 to 11 weeks. Forge shops and screw machine parts producers continue to take up their full bar allocations.

Philadelphia — Delivered prices on hot-rolled bars here reflects an increase in freight rates from Pittsburgh to 49 cents per 100 pounds. Thus, the minimum delivered price for the present amounts to 3.34c per pound, with the dollar reduction by the leading Pittsburgh seller being largely offset by the increase in freight rates.

Cleveland — Although deliveries on alloy bars are extended into August as result of the recent flurry of buying, there is belief there will be no further expansion of this demand in the near future Inquiries based on war scare have dwindled, possibly as result of the recent election in Italy, and belief is held that demand stemming from a national preparedness program will not be felt until late in the year, if then.

Tubular Goods . . .

Tubular Goods Prices, Page 139

Pittsburgh — Further details of National Tube Co.'s recent price action are as follows: Butt weld, standard, black and galvanized, reamed and drifted pipe, extra strong, plain ends, were reduced $2 a ton in the size range ½ to 3-inch, inclusive; oil country casing and oil well tubing, all sizes, grades and classes, including liner pipe, were reduced $1; drill pipe, grade D and E, was reduced $2. No action was taken on seamless. In connection with the average reduction of $3 a ton on carbon mechanical and pressure tubing and the average reduction of $2 a ton on alloy mechanical and pressure tubing, it is pointed out that the reductions represent 2 per cent on quantity extras for carbon grade and 1 per cent on analysis extra for alloy items.

Boston — Merchant steel pipe continues among the products in shortest supply. Pipe quotas for the third quarter, notably for July, are sharply reduced in some instances, reflecting losses in semifinished steel output. Utilities, unable to get all the steel pipe required, are substituting cast iron pipe even in larger diameters,

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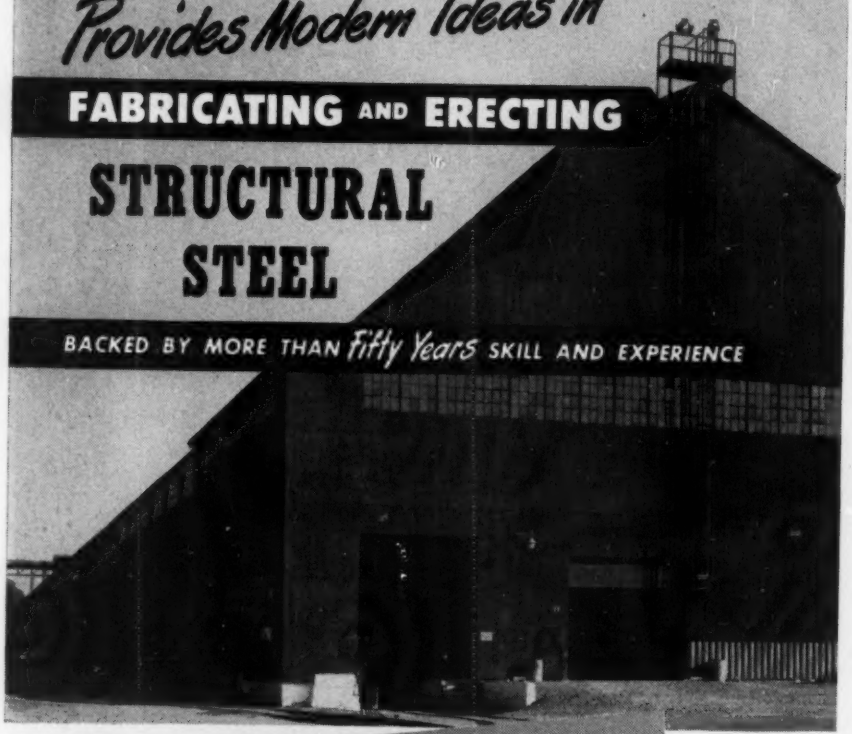

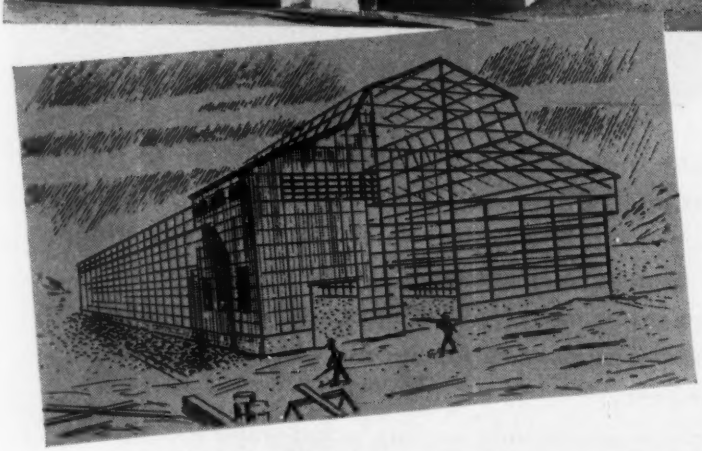

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Seattle — Cast iron pipe demand is slow in view of the inability of mills to make prompt deliveries. The potential market is of major proportions in this area but many projects have been deferred; in other cases, other types of pipe have been purchased.

Sheets, Strip . . .

Sheet Prices, Page 138

Boston — Although the $2 reduction in cold-rolled strip is not uniform to consumers, depending on freight from basing points employed, hot-rolled strip is $1 lower. Part of the latter is taken away from cold reduction mills by higher freights. Currently, substantial portion of high strip used in New England, excepting some Connecticut points, is based at Youngstown. Lower prices for hot-rolled sheets and other flat-rolled products vary, some mills making no changes on hot-rolled. Some have lowered cold-finished sheets $2 a ton and others $1. Reduction in cost of flat-rolled products, delivered to consumers, is slight due to higher freight charges, and, where no revisions are made, the price may be higher. In effect, revisions thus far contribute toward a more mixed steel price structure, stimulating a development that has been growing for some months. Demand for flat-rolled steel is heavy and in excess of allocations and supply and, therefore, ability to obtain steel is of more importance than price.

New York — While new freight rates are being applied to the delivered prices on hot-rolled and galvanized sheets, they are not as yet being reflected in the minimum delivered prices on cold-rolled sheets. This is explained by the fact that the first two items are based on Sparrows Point which takes an interstate rate into New York, effective May 6, while cold-rolled sheets are based on Buffalo, involving an intrastate rate, which is effective May 26. The carriers have petitioned the New York State Commission for an earlier date and it is just possible that it may be granted. The new freight rate from Sparrows Point is 38 cents.

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Cleveland — Effects of the recent disruption to coal mining will be felt to an increasing degree as steel producers reduce summer-month quotas to make good on orders on the books when the coal strike cut steel output. A representative of one producer is expecting July quotas for sheets to be cut 50 per cent or more. That producer already has reduced July pipe quotas 50 per cent, and probably will announce similar cuts on other steel products.

Chicago — Uniform action in reducing sheet and strip prices to meet

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Cincinnati — Pressure for sheet deliveries and for position on schedules is increasing. This demand reflects in part the scarcities attributed to recent light production, and in part to a desire to cover needs against the drain on tonnage for preparedness and export. Smaller quotas for the third quarter are certain because of the recent loss in tonnage due to effects of a flood and shortage of coal. The second quarter carryover will be considerably larger than earlier calculations. The rolling schedule of one district mill was interrupted several days by lack of steel.

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Wire . . .

Wire Prices, Page 139

Boston — While flat low-carbon and bright basic wire has been reduced $2 a ton at Worcester, Mass., indications are that most producers will revise their prices accordingly. Numerous specialties, including switching, book-binders, valve spring and other wire are unchanged. This includes tempered spring stock. Bolt and heading wire and spring wire for bedding is $2 a ton lower. Demand for wire is heavy with third quarter schedules filling; the latter may be subject to changes because of the limited rod supply. Most consumers are taking up full allotments and many are asking for larger tonnages.

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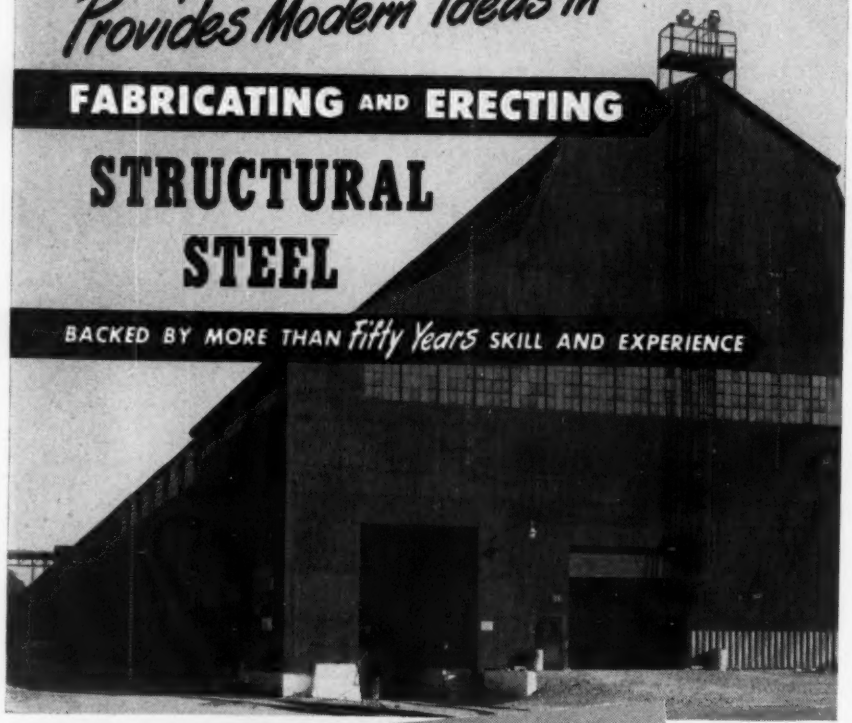

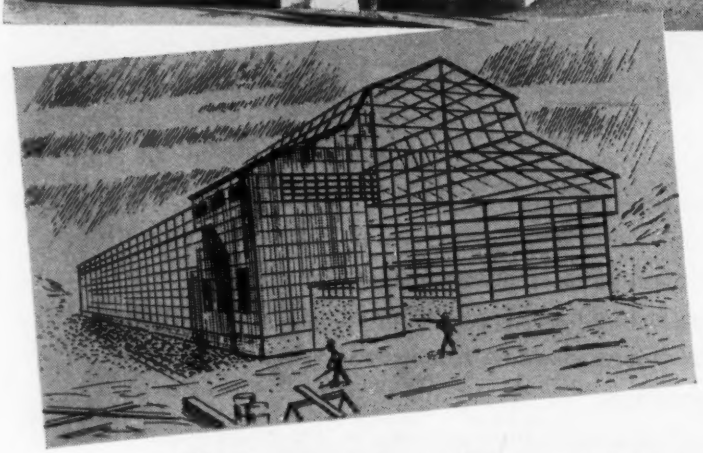

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Plates . . .

Plate Prices, Page 139

New York — Pressure for plates continues strong, most producers now having opened their books for third quarter. Some have accepted no tonnage beyond July and then largely for car builders and railroads under the voluntary allotment program. As a matter of fact, most producers will have arrearages at the end of this quarter which will run well in excess of a month's production; further, certain producers at least will close down the first two weeks in July for vacations. Other producers have set up quotas for the entire three months of the third quarter, with the general run of consumers being allocated less new tonnage than in the current quarter. The new freight rate from Sparrows Point is 38 cents.

Philadelphia — Indications are that the smaller eastern independent plate makers, who have been quoting premium levels, will make no reduction in their prices on plain carbon plates. However, the situation is still being studied, especially with regard to certain specialties, including floor plates on which the leading Pittsburgh producer recently reduced prices $3 a ton only to be followed shortly by a Chicago producer with a reduction of $5. The new freight rate from Sparrows Point to this city is 26 cents per 100 pounds.

Boston — The price range in plates has been widened by the recent price revisions. The reduction in floor plates of $3 a ton is rather general, although some mills are standing unchanged to date on carbon plates. Plate fabricators, including tank shops, are operating with low inventories with prospects slight for improvement during the last half. Shipyard requirements loom higher for late this year with four supertankers scheduled to be built at the Quincy yards of Bethlehem Steel Co., a division which has been engaged largely in war ship construction.

Birmingham — Plate output, although holding close to capacity, still lags behind current needs, especially as regards car building and for warehouse stocking. Jobbers find it increasingly difficult to supply small requirements from stock, although there is talk of more equitable warehouse distribution.

Seattle — Shortage of plates is seriously handicapping plant operations, dropping in some instances to less than 50 per cent of capacity. There is a fair run of business involving less than 100 tons each, chiefly boiler, tank and smokestack jobs but no improvement in the supply situation is expected in the near future.

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 138

Seattle — Rolling mills are fully booked through the third quarter on reinforcing bars and are making every effort to facilitate deliveries and reduce backlogs. There is a major volume of small tonnages offering for school and industrial projects. Mills are naturally trying to first take care of regular customers. No awards in excess of 100 tons were reported this week.

Structural Shapes . . .

Structural Shape Prices, Page 139

Boston — While structural shape prices are $1 lower in some categories, the fabricating shops will not benefit to that extent because of higher freight charges. Regardless of price, the outlook for tonnage in the third quarter is dimmed by the fact that some mills will blank out at least one month to take care of delinquent orders. Private construction is off substantially, although inquiry for public works is holding well. First bids are expected to be taken shortly on the first of 13,500 tons for the East Boston express highway. First letting will be for 8500 tons. Closing on the Augusta, Me., bridge superstructure, involving 3100 tons, has been postponed to May 12.

Philadelphia — Delivered prices on structural shapes here reflect the new 18-cent freight rate from Bethlehem, Pa. Meanwhile, the leading Pittsburgh producer, while having reduced its delivered prices $1 a ton at Pittsburgh, Chicago, Gary and Youngstown has been doing no more than to meet the higher prices that have been ruling here. These higher prices in the East may be reduced soon, although they were unchanged at the time of going to press.

Seattle — Fabricators report the

supply situation has worsened as the recent curtailment in operations at eastern mills is being reflected here in deferred shipments. Local inventories are at minimum levels and with ample backlogs, plants hesitate to take commitments in excess of available supplies in the immediate future.

Latrobe Electric Offers New High-Speed Steels

Pittsburgh — Latrobe Electric Steel Co., Latrobe, Pa., has commenced commercial production of a new line of high-speed steels. This line is distinguished by its chromium, molybdenum and vanadium content with no tungsten present in the steel and is adaptable for applications which do not require full properties in the more common tungsten-bearing high-speed steels, such as small drills and reamers, thread chasers, taps and pipe tabs, etc. The new line is being offered for sale at prices considerably lower than those now charged for standard tungsten-molybdenum and tungsten high-speed steels, the price range being 43 to 68 cents.

Tin Plate . . .

Tin Plate Prices, Page 139

Chicago — Settlement of the dispute with shearmen in Inland Steel Co.'s tin mill was accomplished last week and partial operations were resumed, shear crews being the first personnel brought back to work. Early this week pot and electrolytic lines are expected to be operating at near-normal levels.

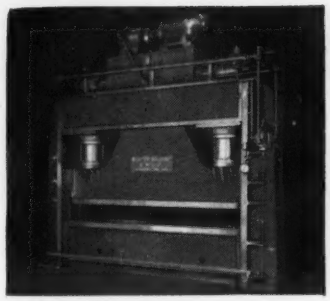
Warehouse . . .

Warehouse Prices, Page 141

Chicago — Price reductions placed in effect May 1 by leading producer have been applied across the board by affiliated warehouses, but discrepancies have yet to be ironed out in certain products. Warehouses supplied by several producers, not all of whom have made reductions, are in a quandary as to pricing policies, but indicate desire to remain competitive. At least another week will be required before the price picture is clarified. Some smaller interests may delay in revising prices until higher-cost inventories are moved out.

Demand for most flat-rolled carbon products has intensified since the coal strike.

Pittsburgh — U. S. Steel Supply Co. has reduced its warehouse price quotations in line with reductions put into effect May 1 by the corporation's operating subsidiaries. Reductions in warehouse prices by this company range between $1 and $3 and apply on carbon and alloy sheets and strip, cold-finished bars, shapes and high-tensile products. Jones & Laughlin Steel Corp. has reduced its warehouse prices on wire products, cold-finished bars, and wire rope in line with reduction in mill quotations. However, until increased costs resulting from higher freight rates can be determined, price action on other warehouse steel items will be delayed.



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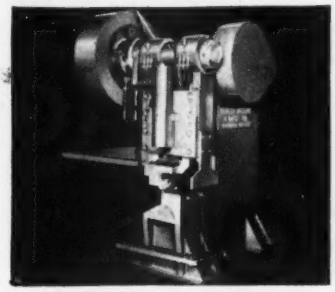

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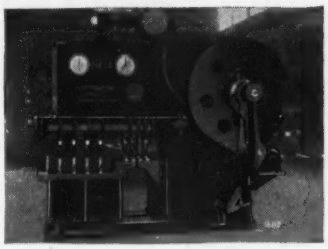
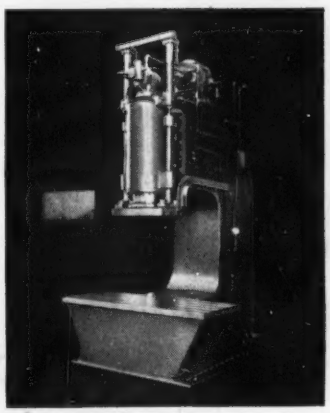


BEATTY No. 14 Toggle Beam Punch for structural steel fabrication.



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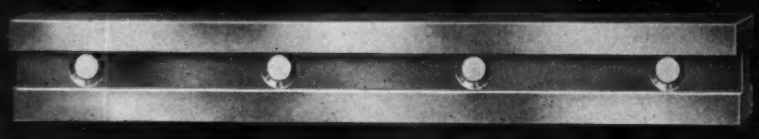

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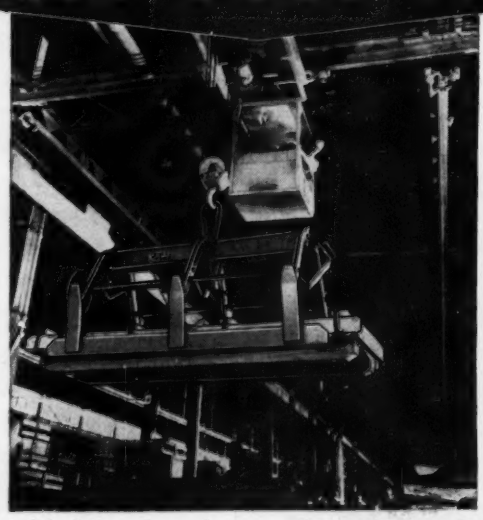

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Pig Iron . . .

Pig Iron Prices, Page 140

New York—Delivered prices on pig iron in this district are higher as a result of the increase in freight rates May 6. The new rate from Bethlehem, Pa., the governing basing point, to Newark, N. J., is $2.39 per gross ton, and to Brooklyn, $3.90. Thus, the new minimum delivered prices to Newark are $42.39 on basic, $42.89 on No. 2 foundry, $43.39 on malleable and $43.89 on Bessemer. To Brooklyn, the new minimum delivered prices are $44.40 on No. 2 foundry and $44.90 on malleable.

While pig iron production has undergone substantial recovery since the coal strike, some producers, feeding this district, have not as yet placed their furnaces under full blast. This is ascribed in part to the threatened rail strike May 11, as they have not had an opportunity of building up coke inventories.

Philadelphia — Delivered prices here on pig iron reflect the recent increase in freight rates. With the new rate from Bethlehem $2.17, the new minimum delivered prices are $42.17 on basic, $42.67 on No. 2 foundry, $43.17 on malleable and $43.67 on bessemer. The new minimum price on low phosphorus, delivered Philadelphia, is $48.81, reflecting a rate of $2.81 per gross ton from Steelton, Pa.

Shortage of iron has seldom, if ever, been more acute. During the past week a number of foundries suspended operations for practically the entire period, due to shortage of coke as well as pig iron. Meanwhile, oven foundry coke has been advanced $1 to $19.55. Philadelphia ovens, and $1.75 to $19.50, Swedeland, Pa.

Some foreign iron continues to be received here, the latest comprising 2007 tons of Australian metal, believed to be for the account of an eastern plate maker.

The new 1800-ton blast furnace at Sparrows Point has been recently blown. However, there is still one blast furnace down for repairs at that point.

Boston — Melters of foundry and malleable pig iron are likely to be confronted with higher iron costs when the price section of Mutual Cooperative contracts come up for consideration in about six weeks. These grades at $45, Everett, Mass., are among the lowest priced in the country; contractural provisions call for a tie-in with Buffalo delivered prices at the expiration of the first of the year, the price not to exceed the delivered cost of Buffalo iron by more than $5 a ton. This is currently around $48 a ton, delivered Boston. Although some of the smaller foundries are melting slightly less iron, others have increased and the output of the Mystic furnace is currently absorbed without adding to inventories. Silver iron is in good demand and limited in supply.

Cleveland — Pig iron shipments have improved considerably over the reduced levels necessitated by the recent coal mining stoppage. However, pressure for deliveries continue unabated inasmuch as foundries which had small inventories of iron practically exhausted them while others in a less favorable position had to curtail production. Delivered prices began at the end of last week to re-

flect the May 6 advance in railroad freight rates.

Chicago — Blast furnace operations had recovered substantially by last week, only one furnace idled by the coal strike now being down. This Inland furnace has been relined and repaired but will probably not be returned to production of merchant iron until next quarter. Another Inland furnace and Republic's furnace were relighted recently, both producing basic. Youngstown Sheet & Tube has one scheduled to go down for relining and enlarging in the near future.

Strike begun last Monday by AF of L foundry workers has sharply cut back melting operations in the area. Affected are about 41 jobbing shops, and between 3000 and 4000 men are idle. Union demands have been scaled down from a 43-cent an hour increase to 13 cents, but companies are holding firm to an offer of a 10-cent an hour raise. Almost without exception the strike-bound plants are taking delivery of all promised coke and pig iron, despite unloading difficulties.

Delivered prices in interstate commerce have been adjusted to cover the new freight rates, effective May 6, and Milwaukee prices are now 14 cents a ton higher.

Buffalo — Material shortages continue to dominate the pig iron trade. No further improvement was noted in production during the week as iron output held at 81.5 per cent of capacity. Producers are still worried over the coal situation. Coal and coke reserves remain low in this area. Meanwhile, foundries continue to operate with inadequate iron shipments. Only a trickle of stock is moving to eastern buyers. Some iron, however, has been sent to Michigan motor casters.

Cincinnati — Shipments of pig iron into this district are expanding slowly, but are not yet up to the tonnage received prior to the coal miners' strike. In the meantime, foundries are being forced to shutdowns or curtailments. Some still are unable to acquire an adequate supply of coke.

Birmingham — Pig iron supplies have increased, following the return of blast furnace operations to the pre-coal-strike rate, but they still fail to meet needs throughout the Southeast. Pipe makers, foundries and other iron-dependent industries are still forced to operate on reduced schedules.

St. Louis—Pig iron production in this district is expected to be back to its 1000-ton a day normal within a few days. Only delaying factor now is a moderate stockpile of inferior quality coking coal accumulated during the coal strike. When that is worked off, coke output will rise from the present 90 per cent rate to 100 per cent. After that time a small price premium, added to iron prices to cover higher freight costs involved in obtaining emergency coal from extraordinary sources, will also be removed. From now on, furnaces will strive to build coal stockpiles to 60 days against the possibility of a new coal strike in June. Demand for iron continues pressing, but real distress is limited. Most melters are working at capacity with supplies already available to them, even though on a hand-to-mouth basis. Some have 10 to 15 days' stockpiles on the ground, a portion of which is the high-tariff Dangerfield iron.

Seattle — Foundries are making the best of the supply situation, cast iron scrap still being scarce and pig iron unobtainable at the moment. Geneva has not yet resumed shipping iron to this area but limited consignments are expected in the near future. The attractive price level of $40 per gross ton has not served to bring into the market sufficient tonnages of scrap which naturally is being used in larger ratio due to the scarcity of pig iron.

Rails, Cars . . .

Track Material Prices, Page 139

New York — Featuring recent railroad buying is the award of 91 diesel-electric locomotives by the New York Central System at an approximate cost of $15,600,000. Orders were placed with the Electro-Motive Divison of General Motors Corp., La Grange, Ill., Fairbanks, Morse & Co., Chicago, and the American Locomotive Co., New York.

April freight car deliveries totaled 9052, American Railway Car Institute announced last week, noting that a production rate above 9000 has been maintained during five months despite continuing material scarcities. New car orders during April totaled 18,252, the highest month since 1941. Of the cars delivered, 6726 were built by the car builders and 2326 were from railroad shops.

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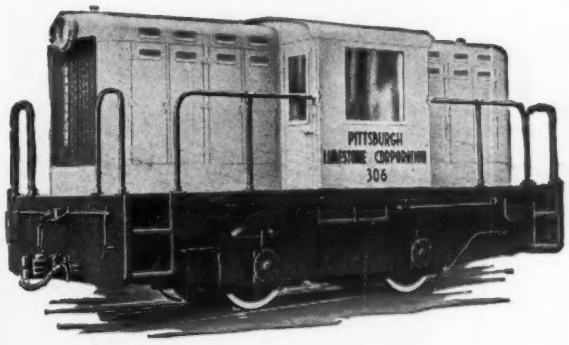

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Scrap . . .

Canada requests halt on shipments of scrap from Buffalo into Dominion

Scrap Prices, Page 144

Buffalo — Canadian acquisitions of scrap here, which for some time have inflated this district's scrap prices and perturbed local consumers, are expected to cease as result of a Canadian government request that the Canadian dealer who has been buying American scrap for shipment from Buffalo to Hamilton, Ont., buy no more scrap for the present time.

This action was a purely voluntary one and a friendly gesture by Canada in response to growing resentment among American interests over scrap shipment from Buffalo at a time when scrap was in relatively short supply in the United States. Action to stop the flow of scrap to Canada had to be on a voluntary basis inasmuch as the United States requires no licenses for export of scrap to that country.

Intensification of scrap shipments to Canada from other United States points, such as Detroit, is not expected, but this situation will be watched, for Canada's policy of subsidies of up to $10 a ton is unchanged.

Although figures as to tonnage that had been moving from Buffalo to Canada were not available, it is said to have been substantial.

Meanwhile, the local deadlock over prices was nearing a showdown. Dealers informed mills that it was difficult to accept additional tonnage at the formula when outside buying was taking place in the midstate and Eastern territories at prices running about $2.50 above the formula. Dealers continue to ship against old contracts negotiated at the formula prices, or $39.75 a ton for steelmaking grades. These contracts are expected to be completed this week.

The milder weather is bringing out a much better supply of material, including a fair quantity of No. 1 heavy melting, which continues to sell above the formula price at a range running anywhere from $43 to $46 a ton.

New York — With a rail strike threatened for May 11, open-hearth scrap consumers are pressing for all the tonnage offered at formula levels. Meanwhile, New York brokers are buying No. 1 and No. 2 heavy melting steel, No. 1 busheling and No. 1 and No. 2 bundles at the unchanged price of $34.03, fob shipping point. Following the recent advance in low phos scrap, all grades of iron and steel scrap are being bought at unchanged prices.

Boston — Open-hearth steel scrap holds to formula prices for the most part, although freight charges are up materially for delivery to Pennsylvania. More tonnage is available, but quality is a complaint with more melters. Cast grades are less active, but prices have not weakened materially. The freight rate to Pittsburgh, including tax, is now around $10.08. Demand for cast for outside shipment holds well and this is a factor in holding up quotations as most of the larger consumers in this area are not pressing for tonnage as heav-

ily as earlier this spring.

Philadelphia—Steel scrap is moving more freely, although still in heavy demand as reflected in higher prices for No. 1 heavy melting steel, which is now quoted $42 to $43, delivered. No. 1 cupola cast also is higher at $63 to $65; malleable, $76 to $78; and clean auto cast, $64. Mills are absorbing the recent freight rate increase on new orders. It is possible that, at least insofar as open-hearth steel is concerned, there may be an increase in formula prices to compensate in part for the higher rates. The new rates on scrap are 56 per cent higher than those prior to the first postwar increase.

Cleveland — Indications that most steel mills are not inclined to absorb the new railroad freight rate advance fit in with the belief held in various quarters that a tendency toward a price easing in the scrap market has been in the making. Although a number of plants from which a considerable volume of scrap flows have been closed temporarily for lack of steel, the movement of scrap continued at a good level last week. At the same time, there were noticeable weaknesses in demand for blast furnace and cast grades. However, quoted prices remained unchanged last week. Steel mills are shying away from additional shipments of the less desirable material. Foundries, with operations hampered by insufficient coke supplies, are said to be less inclined to pay high prices for scrap. While the market in general appears to have an easier tone, reports persist that $3 to $4 over formula prices are being paid for scrap for shipment to Empire Steel Corp., Mansfield, O., subsidiary of Studebaker Corp.

Detroit — Officially, prices being paid for open-hearth grades are stated as "holding at formula," although many brokers are of the opinion sales are being made by dealers at several dollars a ton higher in scattered instances. Such transactions are impossible to track down, so the published market prices are unchanged. The three principal mill buyers here steadfastly refuse to commit for tonnages at a penny over the formula, and reports are heard from Chicago, for instance, of certain mills stepping up their rejections, indicating a more comfortable position on scrap inventory. Foundries, unable to operate because of curtailed coke supplies, are looking at high-priced inventories of cupola cast scrap with a little apprehension, accentuating weakness in this material which skyrocketed in price at about the time Packard started allocating their dealers an extra car for every ton of cast scrap consigned to the factory. The market has never settled down after this disruption, and even last week one dealer reported the fantastic offer of $70 a ton for premium cast material.

Chicago — Formula prices on steelmaking grades prevail in the quiet market. Mills, having reduced finished product prices, would like to see weakness develop in scrap but there has been no trend in this direction. Slightly reduced volume of scrap flow as result of some curtailment in scattered metalworking plants plus poor collection weather are adding support to the present level. Foundry strike in the district

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has restricted activity in these grades and prices hold unchanged.

Pittsburg — Little activity was noted in the scrap market last week. A slight flurry developed in cast grades, however, with considerable tonnage moving within a price range of $66 to $68. Chief concern of foundries and open-hearth operators is the poor quality of scrap. Some interests believe they will have to drop out of the market entirely in order to force scrap interests to clean up the material shipped. Many believe, however, that rejection of all material not meeting specifications would be the best policy to follow.

St. Louis—Steel scrap continues to move freely, with mills staying in the market to further build inventories, already at 45 days or above. All steel grades remain on the formula price. There is some hesitation in transactions in cast grades, probably due to the coke situation. Until coke output picks up, some foundries will continue to hold down cast purchases. A few foundries have withdrawn from the market because inventories are ample. Average foundry inventories also are estimated at 45 days. Cast prices generally have held steady with only minor variations. Prices of short rails eased about $1 a ton last week.

Government Drive for Scrap Stepped Up

With scrap and pig iron reserves in this country down to less than 4,500,000 tons compared with about 10 million in 1940, the government is making a concerted drive to obtain the largest possible flow of domestic and foreign scrap to steel and iron producing plants.

Alex Miller, scrap consultant, Office of Industry Co-operation and chairman of the Interdepartmental Scrap Committee, heads a task force which is undertaking the immediate return of 1 million tons of scrap from Germany. It is estimated there are between 5 and 10 million tons of indigenous iron and steel scrap in that country. U. S. occupation forces in Germany will open bids May 10 for sale of 750,000 tons of scrap, chiefly tanks containing a large percentage of alloy steel. The Navy has 15 sunken German dry docks in European waters which will be offered for sale.

General MacArthur has been requested to submit a report in the amount of scrap to be made available from Army and Navy sources in the Far East. It is estimated there are about 7 million tons of indigenous scrap in the Pacific area, including about 100,000 tons in the Marianas.

Stepping up of defense requirements may affect the amount of material that might be classified as scrap. The Navy will not declare as scrap any material that can be utilized for the nation's current defense program.

Use of scrap and pig iron continued at a high rate in February although the shorter month resulted in a smaller total melt, according to the Bureau of Mines in its latest report on this subject. Steel furnaces continued to use a mixture of 47 per cent scrap and 52 per cent pig iron in February, amounting to 3,310,000 tons of scrap compared with 3,505,000 tons in January, and 3,670,000 tons of pig iron compared with 3,985,000 tons in the previous month.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 140

Chicago — Price increases ranging from $1.10 to $1.75 per ton were placed in effect by leading producers recently, higher costs of coal, freight and materials and supplies being cited as the cause of the action. Demand far outstrips supply and despite the area's gray iron foundry strike pressure for additional tonnage continues. At least one important district interest is still shipping against April commitments.

Cleveland — Coke shipments have returned to the level prevailing before they were interrupted by the recent coal mining stoppage. Because of the great demand for coal, coke producers are unable to get all the high-grade coal they want and use some of the less desirable grades, with a result some of the coke now available is not of the highest quality. This condition is not likely to be rectified soon, inasmuch as coke producers, anticipating another coal mining stoppage at the end of June, are attempting in the limited time available to rebuild coal stocks depleted during the recent mining disruption. New price quotations reflect both the increase in rail rates and an advance in the price of coke to compensate for increased costs encountered in coal procurement.

Iron Ore . . .

Iron Ore Prices, Page 140

Cleveland — Shipments of Lake Superior iron ore totaled 7,677,270 tons in April, an increase of 3,228,859 tons, or 72.58 per cent, over the total for April of last year, according to the Lake Superior Iron Ore Association, this city. Shipments from United States ports totaled 7,629,394 tons last month compared with 4,422,103 tons a year ago while those from Canadian ports totaled 47,876 tons and 26,308 tons, respectively. April, 1948, shipments originated at the following ports: Escanaba, 457,334 tons; Marquette, 430,584; Ashland, 553,900; Superior, 2,688,605; Duluth, 1,705,287; and Two Harbors, 1,793,684 tons. Michipicoten accounted for all of the Canadian shipments in the two comparable months.

Increases above base rates as of Apr. 1, 1947, in ore costs which are for buyer's account, are as follows, effective May 6: Line haul freight rates in upper lakes district, increased a maximum of 11 cents, dumping charges at upper lakes ports, increased 18 per cent to 13 cents per gross ton; dock handling charges at lower lakes ports, increased 18 per cent to following levels: Hold of vessel to rail of vessel, 18 cents; rail of vessel to car, 12 cents; rail of vessel to dock, 28 cents, and dock to car, 18 cents. Line haul freight rates from lower lakes ports are increased to a maximum of 28 cents per gross ton. No change has been made in storage charges.

Industry Restudying Pricing Policies

(*Continued from Page 72*)

time than they allow to others within which to place orders at former prices, nor do they allow any buyers more time than is allowed to others within which to call for delivery after orders have been placed, nor do they book orders for tank car lots from buyers customarily buying in tank wagon quantities;

Discounts Discontinued—"3—Since Dec. 21, 1942, respondents have not, and they do not now, sell starches or starch products to Keever Starch Co. or Stein-Hall & Co. or Stein-Hall Mfg. Co. at prices reflecting discounts, rebates or other allowances from respondents' regular or list prices currently charged to other buyers at the times of sales to these companies;

"4—Since the commision made and entered its order herein, respondents have not sold and they do not now sell, gluten feed and meal to certain buyers at prices reflecting allowances or discounts from contemporaneous prices not allowed to other customers;

"5—As of Apr. 25, 1945, repondents have discontinued their co-operative advertising arrangement with the Curtiss Candy Co. and they have no advertising arrangement such as described in the commission's findings as to the facts and conclusion with the Curtiss Candy Co., or with any other candy manufacturer;

"6—Since prior to the date the commission made and entered its order of Mar. 16, 1942, respondents have not contracted to sell, nor have they sold, corn starch or other starch products to the Huron Milling Co., or to the Keever Starch Co., nor do they sell any of such products to any other purchasers, on any condition, agreement or understanding that such purchaser shall not use or deal in corn starch or other starch products of a competitor or competitors of correspondents, and the agreements previously existing between respondents and the Huron Milling Co. and Keever Starch Co. have been modified."

Staley Compliance—The report of the A. E. Staley Mfg. Co., Decatur, Ill., said: "Respondents have changed their method of pricing glucose and are now following the pricing and booking methods described below.

"Respondents are now selling upon a delivered price equal to their factory price at Decatur, Ill., plus the published freight rate from Decatur, Ill., to destination.

"Respondents are now selling f.o.b. Decatur, Ill., or delivered in Decatur,

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Ill., at respondents' current factory base price plus an additional charge representing approximately average inbound freight which respondents pay on deliveries in Decatur, and on sales f.o.b. Decatur, which freight respondents cannot cancel against freight or outbound shipments under respondents' milling in transit privileges.

"Respondents are not extending the period within which any purchaser must accept delivery of corn syrup subsequent to a price advance unless currently a similar extension is granted to all purchasers competing with such purchaser. Respondents are refusing to enter any bookings that respondents know are not bona fide, and are refusing to enter any bookings respondents have any reason to believe are not bona fide until and unless such bookings are found to be bona fide. Respondents are not extending the time to any purchaser within which corn syrup may be purchased after a price advance at the price prior to the advance unless concurrently a similar extension is granted to all purchasers competing with such purchaser.

"Although our present Decatur prices for corn syrup and 'Sweetose' are 5c per cwt under our former Chicago base prices, not all of our former delivered prices have been affected. The greatest reductions occurred in the area adjacent to Decatur, some reductions have been made in Indiana, Ohio, Kentucky, Tennessee, the Pacific Coast and other points, while in the eastern seaboard (where the freight rate from Chicago is 5c per cwt less than our rate) our prices remain unchanged."

No fewer than 15 price cases now are pending as a result of action by the Federal Trade Commission. One of them, interestingly enough, is against Corn Products Refining Co. and A. E. Staley Co. and 17 other manufacturers of corn derivatives. It was brought on June 26, 1947, and charges this industry with "engaging in a combination and conspiracy to fix and maintain the prices, terms and conditions of sales of their products with the result that competition in the industry has been suppressed."

Foundrymen Ponder Output, Cast Problems

(*Continued from Page 66*)

small utility all-purpose core oven.

Harnischfeger Corp., Milwaukee—electromagnetic crane control.

International Molding Machine Co., La Grange Park, Ill.—several coreblowers.

Material Movement Industries Inc., Skokie, Ill.—bulk material conveyor with permanent magnets to remove iron.

Blaw-Knox Division of Blaw-Knox Co., Pittsburgh—single line hook-on type foundry sand buckets, ranging in capacity from 1/2 to 1-1/2 cubic yards, to meet operating head room clearances varying from 6 feet, 7 inches, to 19 feet, 7 inches. Buckets equipped with safety devices preventing accidental discharge in transporting.

Butler Bin Co., Waukesha, Wis.—sand carscoop equipped with 25 h.p. gas engine.

Electro Refractories & Alloys Corp., Buffalo — small bottom crucibles said to give more combustion space, resulting in fuel savings and increased crucible life.

Fox Grinders Inc., Pittsburgh — new small swing frame cutoff machine for bronze and aluminum castings.

Harbison-Walker Refractories Co., Pittsburgh — new universal cupola blocks. Cupolas of any diameter from less than 2 feet to 8 feet or more can be fitted with one shape of these blocks.

Herman Pneumatic Machine Co., Pittsburgh — new two-station index machine designed for production of large molds, such as sanitary ware, railroad Car castings, etc.

Laclede-Christy Clay Products Co., St. Louis — exhibited "Slagtite," a new refractory for constructing all types of ladles used in iron industry.

Pittsburgh Crushed Steel Co., Pittsburgh — heat treated shot and grit for cleaning castings.

Pittsburgh Metals Purifying Co., Pittsburgh — exhibited for first time its Exothermic liquid slag, carbon-free pipe eliminator for castings and ingot molds. It is claimed temperatures up to 4000 degrees Fahr. can be obtained.

H. H. Robertson Co., Pittsburgh—recently developed electrically operated foundry ventilator equipment for quick removal of smoke, fumes and dust.

Royer Foundry & Machine Co., Kingston, Pa. — exhibited for the first time its self-loading sand conditioner. Equipment is rated at 40 to 50 tons per hour with one operator, and has variable speeds permitting moving forward or backward at from 6.2 to 50.1 feet per minute.

Arcade Mfg. Division, Rockwell Mfg. Co., Freeport, Ill.—jolt squeeze pin strip machine which will strip the pattern on down stroke of the squeeze, or it can be used as a pin push off.

Syntron Co., Homer City, Pa. — vibratory bowl feeder for feeding

Why Morton's Salt Tablets to fight "heat fatigue"?

You know, of course, that salt tablets at every drinking fountain are a must in modern plants. For years, industrial physicians and safety engineers have recommended salt tablets as low-cost insurance against the loss of efficiency and man-hours that "heat fatigue" causes. But it is vitally important that workers **accept** the salt tablets you provide them—are sure they are pure, reliable, safe.

Workers know Morton's Salt

Undoubtedly most of your employees use Morton's Table Salt in their homes. They know it is dependable and pure. So they accept Morton's Salt Tablets without hesitation. They know they are not some strange "medicine," but a wholesome health aid backed by a familiar name.

Cost less than 1¢ a man per week

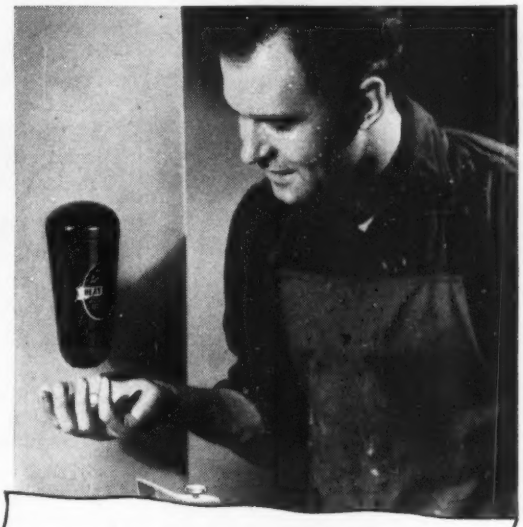
Morton's Heat Relief Salt Tablets—the best that money can buy—cost so little! Can you afford to be without "heat fatigue" protection in your plant? Order Morton's Salt Tablets and Dispensers from your distributor, or directly from this advertisement. Write for free folder. MORTON SALT COMPANY, 120 So. La Salle St., Chicago 3, Ill.

Modern Plastic Dispenser. Practical, accurate, large capacity. 1000 tablet capacity.....$3.25

Heavy Duty Dispenser. Strong metal for rough treatment. Accurate. 500 tablet capacity.....$4.00

Morton's Salt Tablets

Case of 6000, 10-grain, plain salt tablets....$2.10
Case of 6000 8-grain Salt Dextrose Tablets.$2.60



"Heat Fatigue" costs money!

Sweating robs the body of salt. This causes weariness—inability to work efficiently—and eventually, heat-cramps and prostration. "Heat fatigue" cuts down productivity, steps up absenteeism.

Morton's Salt Tablets act **fast** to replace lost body-salt—help keep production and efficiency at high levels. They're pleasant, easy to take, inexpensive.

A B MURRAY CO INC

Distributors of Tubular Products Since 1845

Announce the Opening of a

New Warehouse and Fabricating Plant

AT VERSAILLES, McKEESPORT, PENNA.

on May 1, 1948

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BOILER AND PRESSURE TUBES

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MECHANICAL TUBING

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TUBE INVENTORY

A B Murray Co., Inc.
P. O. Box 476, Elizabeth, N. J.

Please send me each month your Tube Stock Inventory Bulletin.

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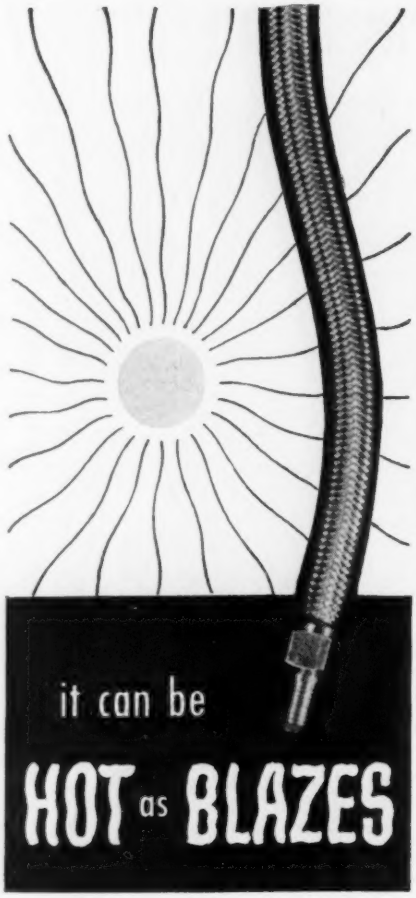


yet

Titeflex

will stand up!

TITEFLEX All-Metal Flexible Tubing can be furnished with innercore made of any one of five different metals to meet the temperature requirements of practically any application. The top working temperatures of tubing made from these five metals are as follows:

Brass . . . . . 250° F.
Bronze . . . . . 325° F.
Monel . . . . . 800° F.
Stainless . . . . . 800° F.
Inconel . . . . . 1700° F.

Remember, too, that TITEFLEX is constructed entirely of metal—with no packing to disintegrate because of heat or other abuse. TITEFLEX engineers will gladly assist you in selecting exactly the right type tubing to meet your temperature requirements, as well as other operating conditions. Literature on request.

Titeflex, Inc. 531 Frelinghuysen Ave., Newark, 5, N. J.
Exclusive Manufacturers of Titeflex high quality products for more than 30 years
Sales Offices: CHICAGO CLEVELAND DETROIT PHILADELPHIA LOS ANGELES BOSTON SAN FRANCISCO TORONTO

small cylindrical shaped objects in single file one at a time. Movement of pieces up the spiral trough and out the discharge is by gentle electro magnetic vibration that will not damage fragile pieces, it is claimed.

Claude B. Schneible Co., Detroit—exhibited its foundry dust control and ventilation equipment featuring recently developed compensating fractionating uni-flo slide hood.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

650 tons, addition, Schmidt brewery, Philadelphia, through Morris Wheeler & Co., that city, to Bethlehem Steel Co.

395 tons, gates and purification plant, Penn Grove dam, Oxford, Pa., to American Bridge Co., Pittsburgh.

340 tons, five miscellaneous buildings, to Grand Iron Works, New York city.

STRUCTURAL STEEL PENDING

2900 tons, unstated construction at Richland, Wash.; bids in, contract pending.

455 tons, overpasses, Bloomfield Ave., Erie railroad and Passaic Ave., Clifton, N. J.; bids May 20, state highway department, Trenton.

200 tons, including 40 tons reinforcing, Washington state bridge, Cowlitz county; bids to Olympia May 7.

REINFORCING BARS . . .

REINFORCING BARS PENDING

2150 tons, earthfill dam, Missouri Basin project, Smoky Hill river, near Ellis, Kan.; bids to U. S. Engineer, Denver.

475 tons, Navy, bureau of supplies and accounts, east and west yards; bids May 11, inv. 5857.

235 tons, highway, route S-3, section 3-B, Clifton, N. J.; bids May 20, state highway department, Trenton.

210 tons, overpasses, Bloomfield Ave., Erie railroad and Passaic Ave., Clifton, N. J.; bids May 20, state highway department, Trenton.

100 tons or more, Oregon state bridge, Lincoln county; Tom Lillebo, Reedsport, Oreg., awarded general contract, low $95,537.

PIPE . . .

CAST IRON PIPE PLACED

1700 tons, 114,400 feet, 6 to 12 in. Class 150, cast iron pipe, for Spokane, Wash.; awarded to Pacific States Cast Iron Co., Provo, Utah.

CAST IRON PIPE PENDING

Unstated, 20 and 14 inch; bids to H. F. Green, city clerk, Puyallup, Wash., May 26; also alternatives.

STEEL PIPE PENDING

Unstated, 4000 feet, 4 inch and 4000 feet 6 inch, 12 gage, steel pipe, dipped and wrapped, bids in to Kent, Wash., May 3.

RAILS, CARS . . .

LOCOMOTIVES PLACED

New York Central and two affiliated railroads, the Indiana Harbor Belt and the Pittsburgh & Lake Erie, 91 diesel-electric locomotives, placed with Electro-Motive Division, General Motors Corp., La Grange, Ill.; Fairbanks-Morse & Co., Chicago; and American Locomotive Co., New York.

RAILROAD CARS PLACED

St. Louis Southwestern, fifty 70-ton covered hopper cars to American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Delaware, Lackawanna & Western, 500 fifty-ton box cars and 100 seventy-ton covered hopper cars; bids asked.

CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM — Knight Electric Co. has awarded a $70,000 contract to E. E. Kellett, 1701 Roseland Dr., for construction of a warehouse and office building.

CHILDERSBURG, ALA.—American Development Co., c/o contractor, has awarded a $20 million contract to Daniel Construction Co., 822 Seventh Ave. S, Birmingham, for erection of a rayon plant.

IDAHO

DRIGGS, IDAHO—Idaho Coal Mining Co. has been incorporated for $500,000 by J. B. Williamson, Turtle Creek, Pa., and R. H. Russell, Spokane, Wash.

MARYLAND

BALTIMORE—Abco Machine Co. Inc., Ellsworth M. Parks, president, 546 S. Longwood St., will start work soon on a plant addition.

BALTIMORE—Charles T. Brandt Inc., has awarded a $105,000 contract to Davis Construction Co., 320 W. 24th St., for erection of a metal fabrication shop addition.

ILCHESTER, MD.—Bartgis Bros. Co., J. S. Miller, president, plans to spend $500,000 for installation of a new boiler plant and equipment.

MICHIGAN

DOWAGIAC, MICH.—Peerless Foundry Co., F. Mutz, president, 1845 Ludlow Ave., Indianapolis, will build a $100,000 factory here.

MINNESOTA

ST. PAUL—Bechik Products Co., 786 University Ave., will build a $100,000 factory and office at Eustis St. and Wabash Ave.

MISSOURI

LAMAR, MO.—Hutchens Metal Products Co. will build a $100,000 factory for production of farm wagons.

MONTANA

KALISPELL, MONT.—Department of the Interior has awarded a $43,431,000 contract for construction of the Hungry Horse Dam on the Flathead River near here to General Construction Co., Seattle, Shea Co., Alhambra, Calif., and Morrison-Knudsen Co. Inc., Boise, Idaho.

NEW YORK

NIAGARA FALLS, N. Y.—International Graphite Electrode Corp., Packard Rd., plans to build a $176,500 furnace building.

OKLAHOMA

CUSHING, OKLA.—Midland Co-operative Refinery plans to spend $500,000 remodeling and enlarging a refinery.

TULSA, OKLA.—Texas Co., Philtower Bldg., will spend $1 million for additions to its West Tulsa refinery.

PENNSYLVANIA

NEW CASTLE, PA.—Pennsylvania Power Co. will build plant and line additions costing $2,097,200.

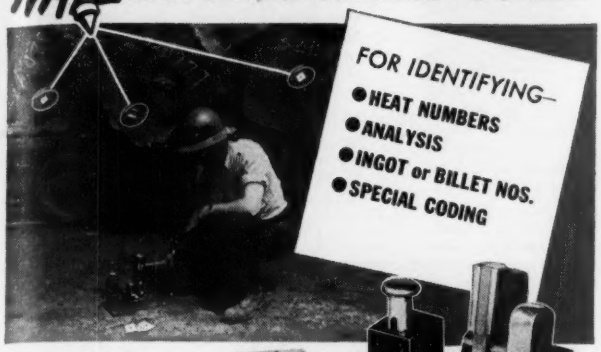
PHILADELPHIA — Brown Instrument Co., Wayne and Roberts Aves., have made preliminary plans for a 4-story plant and office to cost over $250,000.

WEST READING, PA.—Metropolitan Edison Co., 412 Washington St., Reading, now has studies in progress for an electric power plant to cost $500,000.

TENNESSEE

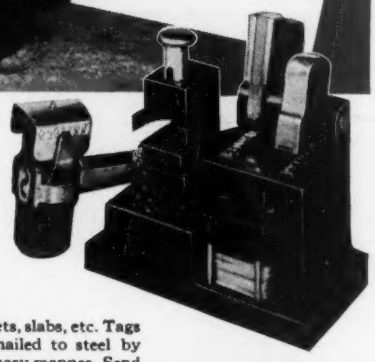
CHATTANOOGA, TENN.—Tennessee Products & Chemical Corp., c/o contractor, has awarded a $1 million contract to Blaw-

NAIL IDENTIFICATION TAGS TO STEEL!



—with the

"SAFETY" TAG EMBOSSING and TAGGING OUTFIT



It's hard to believe, but it's true—this Outfit enables you to quickly nail metal identification tags to hot or cold steel ingots, billets, slabs, etc. Tags are embossed, pierced and nailed to steel by swinging hammer in the ordinary manner. Send for complete data today on this remarkable unit.

Write for Bulletin J-547

M. E. CUNNINGHAM CO.
SAFETY STEEL STAMPS

172 East Carson Street • Pittsburgh 19, Pa.

Round Strand
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"HERCULES"* (RED STRAND) the DEPENDABLE WIRE ROPE for any TOUGH JOB

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Preformed
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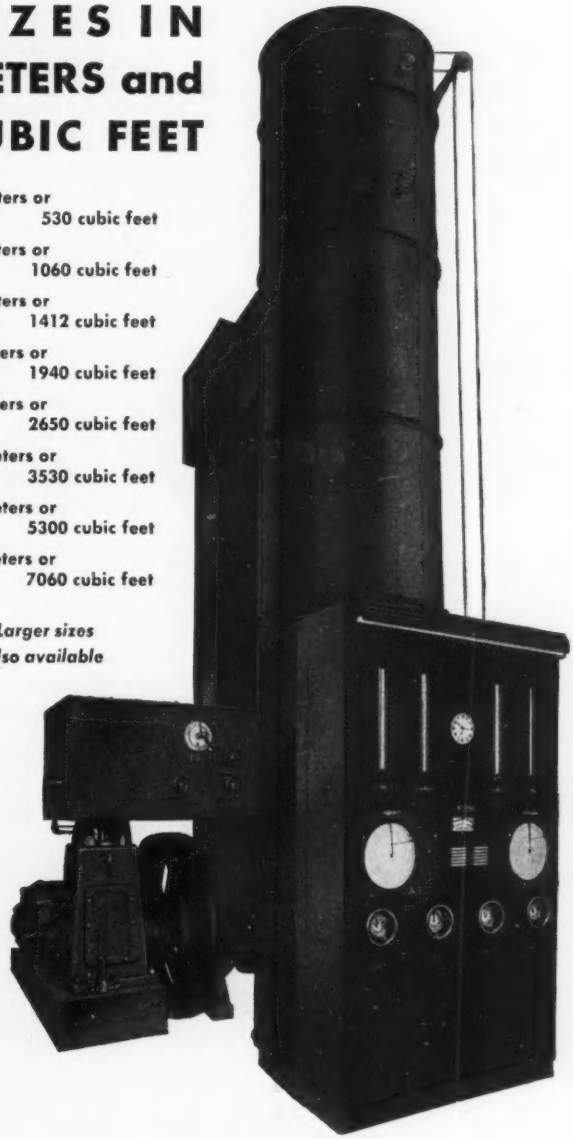
A. LESCHEN & SONS ROPE CO.
ESTABLISHED 1857
5909 Kennerly Avenue — St. Louis 12, Mo.
NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

Expansion Engine Type Medium Pressure
OXYGEN and NITROGEN
PRODUCING PLANTS

SIZES IN METERS and CUBIC FEET

15 Meters or 530 cubic feet
30 Meters or 1060 cubic feet
40 Meters or 1412 cubic feet
55 Meters or 1940 cubic feet
75 Meters or 2650 cubic feet
100 Meters or 3530 cubic feet
150 Meters or 5300 cubic feet
200 Meters or 7060 cubic feet

Larger sizes also available



Built in standard size as listed above in single and double rectification units. Streamlined panel provides quick visibility of all gauges. Compact design—requires minimum of floor space.

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Manufacturers of
CONSULTING • DESIGNING • RESEARCH
CYLINDERS AND GAS PRODUCING EQUIPMENT
ACETYLENE • OXYGEN • HYDROGEN • NITROGEN
O'FALLON, ILLINOIS

Knox Co., Farmers Bldg., Pittsburgh, for construction of two plant buildings.

COLUMBIA, TENN.—Monsanto Chemical Co. will repair wind-storm damage to its plant here at a cost of $500,000.

JACKSON, TENN.—Ray-O-Vac Co. has begun work on a new building on Middleton St. to cost $150,000.

MEMPHIS, TENN. — International Harvester Co. has announced plans for a project here to include a branch office, showroom and parts depot. Cost will be at least $1,500,000.

NASHVILLE, TENN.—Nashville Electric Service, Church St., plans to build a 62 kv power substation on belt line around city. Cost will be $450,000.

NASHVILLE, TENN.—Mantle Lamp Co., 223 W. Jackson St., Chicago, will build a $4 million plant.

TEXAS

CARTHAGE, TEX.—Texas Gas Transmission Corp. plans construction of a 26-in. gas pipeline connecting Carthage field with Ohio and points along the route. Cost will be $64 million.

DALLAS, TEX.—Texas Engineering & Mfg. Co. announces receipt of various types of contracts amounting to nearly $1 million. Orders include contracts for the manufacture of vending machines, tractor hoods and assemblies for the Fairchild C-82 Packet plane.

DALLAS, TEX.—Daniel Auto Radiator Mfg. Co. has rejected all bids for an industrial building to be built on Pittsburgh St. and Industrial Blvd. Architect is Wyatt C. Hedrick, 904 Ft. Worth Ave.

DALLAS, TEX.—Forney Engineering Co., 3010 Main St., will build a $70,000 building.

EL PASO, TEX.—El Paso Electric Co. will spend $250,000 on additional power plant expansions and improvements and $275,000 for additional line extensions.

FT. WORTH, TEX.—Ft. Worth Steel & Machinery Co. recently suffered damages estimated at $150,000 from fire at its plant.

FT. WORTH, TEX.—Consolidated Chemical Industries Inc., Old Denton Rd., will build a $100,000 plant.

GRAND PRAIRIE, TEX. — United Aircraft Corp., 550 Main St., Stratford, Conn., is remodeling and altering a portion of the old North American Aviation plant at a cost of $500,000.

HOUSTON, TEX.—Phillips Petroleum Co., K. S. Adams, president, Bartlesville, Okla., plans to build a $10 million fertilizer plant on the Houston ship channel.

HOUSTON, TEX.—Hunt Tool Co., 1945 St. Bernard St., will build a $72,000 machine shop.

LONGVIEW, TEX. — North American Motor Corp., John Tjaarda, president, will build a $100,000 auto manufacturing plant.

RIO GRANDE CITY, TEX.—Sun Oil Co., M. E. Esperson Bldg., Houston, plans a project to include a natural gas conservation plant, pipelines and other facilities. Cost will be $1,675,000.

RUSK, TEX.—Valencia Iron & Chemical Corp., Col. E. F. McCrossin, president, will build a $500,000 chemical plant.

TEXAS—Texas Gas Transmission Corp. has plans in progress to build an 800-mile natural gas pipeline from Texas to a point near Middletown, O., at a cost of $64 million. Texas Gas recently acquired by merger properties of Memphis Natural Gas Co. and Kentucky Natural Gas Corp.

TEXAS CITY, TEX.—Carbide & Carbon Chemical Corp. has awarded a $120,000 contract to Nunez Construction Co. for erection of barge docking facilities.

UTAH

SALT LAKE CITY, UTAH—Utah Oil Refining Co., Utah Oil Bldg., has awarded a $2,500,000 contract to M. W. Kellogg Co., 225 Broadway, New York, for construction of a propane de-asphalting plant.

VIRGINIA

LYNCHBURG, VA.—Philadelphia Gear Works, Russell C. Ball, president, Philadelphia, has authorized Wiley & Wison Engineering Co. to receive bids for establishment of a branch plant here on Kemper St.

WASHINGTON

SEATTLE—Magnesium Foundries Inc. plans to undertake an alterations and retooling program which will treble its output. Project includes installation of two continuous-flow furnaces.

CANADA

BURNABY, B. C.—B. A. Oil Co. Ltd., Royal Bank Bldg., Toronto, will spend $1 million on oil refinery extensions.

VANCOUVER, B. C.—Canada Wire & Cable Co. Ltd., 1200 Homer St., will build a wire plant here.

SOUTH PORCUPINE, ONT.—Buffalo Ankerite Mines Ltd. plans a $400,000 mine development program.

ST. THOMAS, ONT.—Erie Iron Works plans to build a $100,000 boiler house.

TORONTO, ONT.—Madawaska Feldspar Co. Ltd., c/o G. S. Saunderson K. C., 80 King St., will spend $100,000 to develop mineral deposits.

YELLOWKNIFE, NORTH WEST TERRITORIES—Akaitcho Yellowknife Mine Ltd., 25 W. Kind St., Toronto, will build a complete mining plant at a cost of $500,000.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page 141*)

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c, c.l. packed 6.05c, ton lot 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.